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**Joint HEPA Europe & AIESEP Symposium on
school- and community-based PE & HEPA networks
for daily physical activities**

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Moving up Physical Education
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- 1. Cochrane Database Systematic Reviews on school- and community based HEPA/HEPE intervention studies: Waters, et al. 2011; Dobbins, et al. 2013; Baker, et al., 2015
- 2. World-wide Review of the American Healthcare, Reserach & Quality Agency (AHRQ) on effectiveness of childhood obesity programs: Wang, et. al, 2013, 2015
- 3. Review of school- and community based PE & PA intervention studies in EU-member states:
 - Bemelmans, et al., 2014; Mura, et. al., 2015
- 4. Final results

1. Cochrane Database Systematic Reviews

- A selection of school- and community-based interventions to promote health care by physical education and physical activity for children and adolescents

Cochrane Database Systematic Reviews: Timeline & Records

- Campbell, et al., (2002): 1,043 publ. – 6 papers
- Summerbell, et al., (2005):
- Oude Luttikhuis, et al., (2009): 2,401 publ.- 17 papers
- Waters, E. et al., (2011): 17,409 publ - 55 papers
- **Dobbins, M. et al. ,(2013): 16,219 publ. - 44 papers**
- Langford, R. et.al, (2014):
- Saunders, et al., (2014):
- **Baker, et al.,(2015): 27,089 publ. - 33 papers**

Cochrane Database Systematic Reviews

- **Oude Luttikhuis, et al., (2009):** Interventions for treating obesity in children, (Wiley & Sons)
- **Dobbins, M. et al. ,(2013):** **School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6 to 18.** (Wiley & Sons)
- **Baker, et al., (2015):** **Community wide interventions for increasing physical activity (Review),** (Wiley & Sons)

Cochrane Review Records: 2013

	total screened studies	excluded studies	eligibil studies	excluded eligibil studies
Records	16,219	15,632	587	543

Only n= 44 studies were included due to the selection criteria: only randomized controlled trials (RCT) with a minimum of intervention duration of 12 weeks. Of the 543 excluded studies relevant medical outcome was not recorded (n=127), not a RCT (n=109), not relevant to public health (n=77), no control group (n= 33): in total n= 313 (63,7%)

Dobbins, M. et al. (2013), School-based physical activity programs for promoting physical activity in children and adolescents aged 6 to 18.
Health benefits required for: (1st) rate of MVPA, time spent of MVPA, time spent on TV watching ; (2nd) diastolic/systolic blood pressure; cholesterol, BMI, VO2max, pulse rate

RESULTS of the Dobbins et.al. 2013 Review

- „The evidence suggests that school-based physical activity interventions of longer duration may be needed to effect change in duration and rate of physical activity and VO2 max among grade school children“ (p.23).
- „The evidence also suggests that effective school-based interventions include some combination of school curricula, printed educational materials, and ... educational sessions, physical activity special sessions, and community-based initiatives“ (ibid).

Cochrane Review Records: 2015

	total screened papers	excluded papers	eligibil studies	excluded eligibil studies
Records	27,089	26,820	269	235

Only n= 33 studies (one ongoing) were included due to the selection criteria: only cluster randomised & randomised controlled trials (RCT) with a minimum of intervention duration of 6 month. „Overall, we still found no consistent evidence to support the effectiveness of multi-component community-wide interventions“ (p.26) However, for one study (Simon, 2008) which was the only one reported on schools with a focus on a community-wide network significant effectiveness was recorded !

Baker, PRA, et al. (2015), Community-wide interventions for increasing physical activity. Expected health benefits for: „effects of community wide, multi-strategic interventions upon community levels of physical activity“ (p.7); e.g., „to describe other health (e.g. cardiovascular disease morbidity) and behavioural effects (e.g. diet) where appropriate outcomes are available“ (ibid.)

RESULTS of the Baker et al. 2015 Review

- „Overall, we still found no consistent evidence to support the effectiveness of multi-component community wide interventions *to increase population levels of physical activity*, with the weight of the evidence indicating no increase in physical activity levels“ (p.26).
- „The recent Lancet series on physical activity, published in London 2012, ...came to a slightly different conclusion on effectiveness. (...) Our findings differ as we included only studies with an element of controlled design and not those with pre-post measures only“ (ibid.).

RESULTS of the Baker et al. 2015 Review

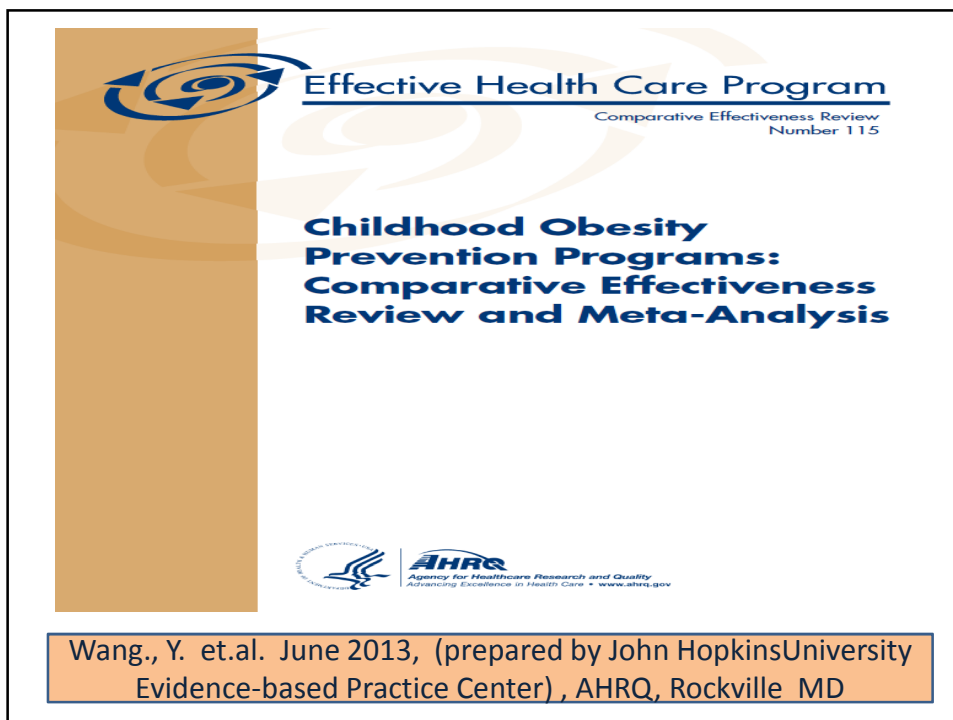
- **CAUTION is needed not only because of the differences in design!**
- Bakers et al. very current review examined merely *non-school-based studies* but other community-wide efforts with special interest in measurement of physical activity levels (i.e. time spend on PA or steps increased or energy expenditure) of different community populations . Only *one study on the school setting* (Simon, 2008) was included with shows *significant effects* (cf. p. 23).

Many journal-based international reviews on school-based interventions

- Doak et al., (2006): *Obs. Rev.* 7: 111
- Sluijs, et al. (2007): *BMJ*, 355: 701
- Brown & Summerbell (2008): *Obs. Rev.* 10: 110
- Kropski et al., (2008);, *Obs.* 16: 1009
- Harris et al., (2009): *CMAJ*, 180: 719
- Kriemler et al., (2011): *BMJ*, 45: 923
- Beets, et al., (2009): *Am J Prev. Med*, 36: 527
- Pate, et al., (2011): *Quest*, 63: 19
- Eime, et al. (2013): *Int.J.BehNut.PA* 10: 98

World-wide Reviews and Reviews of Reviews

- Wang, Y. et.al., (2013): ***Childhood Obesity Prevention Programs: Comparative Effectiveness Review and Meta-Analysis*** (AHRQ), Rockville: MD
- Wang, Y. et.al. (2015): What childhood obesity prevention programmes work? A systematic review and meta-analysis, *Obesity Review*, doi: 10.1111/obr. 12277



Design and Structure of the Review

- The Comparative Effectiveness Review No. 115 is divided into THREE different program components and FOUR different setting components
- The THREE program components are: singular PA, singular Diet, **combination of PA & Diet (C)**
- The FOUR setting components are: based only in schools (1); based in schools with a home component (2); based at schools with a community component (2); **based at school with a home and a community component (3).**

Table 5. Summary of the strength of evidence for weight-related outcomes in studies taking place in a school setting

Setting	Intervention, n	Years of Publication	Enrolled Participants	Studies With Low/Moderate/High Risk of Bias(n)	% With Favorable (Statistically Sig) Outcome	% With Favorable Outcome (Does Not Need to be Stat Sig)	Risk of Bias	Consistency	Precision	Directness	Strength of the Evidence
School	D, 2	1995-2012	1,782	0/2/0	50	100	Moderate	Consistent	Imprecise	Direct	Moderate
	PA, 15	1993-2011	10,086	0/13/2	26	73	Moderate	Consistent	Imprecise	Direct	Moderate
	C, 37	1985-2012	41,875	2/27/8	45	54	Low	Inconsistent	Imprecise	Direct	Insufficient

D = diet intervention; PA = physical activity intervention; C = combination of diet and physical activity interventions
 *Total = 54—one study reported on diet, physical activity, and combination interventions, therefore was counted more than once.

Table 8. Summary of the strength of evidence for weight-related outcomes in studies taking place in a school setting with a home component

Setting	Intervention, n	Years of Publication	Enrolled Participants	Studies With Low/Moderate/High Risk of Bias(n)	% With Favorable (Statistically Sig) Outcome	% With Favorable Outcome (Does Not Need to be Stat Sig)	Risk of Bias	Consistency	Precision	Directness	Strength of the Evidence
School-Home	D, 1	1986	1,321	0/1/0	100	100	Moderate	NA	Precise	Direct	Insufficient
	PA, 3	1999-2010	1,854	1/2/0	100	100	Moderate	Consistent	Precise	Direct	High
	C, 26	1991-2012	25,438	2/20/4	39	81	Moderate	Consistent	Precise	Direct	Moderate

D = diet intervention; PA = physical activity intervention; C = combination of diet and physical activity interventions

Table 14. Summary of the strength of evidence for weight-related outcomes in studies taking place in schools with a community component

Setting	Intervention, n	Years of Publication	Enrolled Participants	Studies with Low/Moderate/High Risk of Bias(n)	% With Favorable (Statistically Sig) Outcome	% With Favorable Outcome (Does Not Need to be Stat Sig)	Risk of Bias	Consistency	Precision	Directness	Strength of the Evidence
School-Community	D,1	2009	2,950	0/1/0	100	100	Moderate	NA	Precise	Direct	Insufficient
	PA,1	2008	1,721	0/0/1	0	0	High	NA	Imprecise	Direct	Insufficient
	C,4	1997-2012	3,017	0/2/2	25	75	Moderate	Consistent	Imprecise	Direct	Moderate

D = diet intervention; PA = physical activity intervention; C = combination of diet and physical activity interventions

Table 11. Summary of the strength of evidence for weight-related outcomes in studies taking place in schools with a home and community component

Setting	Intervention, n	Years of Publication	Enrolled Participants	Studies With Low/Moderate/High Risk of Bias(n)	% With Favorable (Statistically Sig) Outcome	% With Favorable Outcome (Does Not Need to be Stat Sig)	Risk of Bias	Consistency	Precision	Directness	Strength of the Evidence
School-Home-Community	PA,1	2010	2,829	0/1/0	0	0	Moderate	NA	Precise	Direct	Insufficient
	C,8	2008-2012	11,525	1/4/3	12.5	81	Moderate	Consistent	Imprecise	Direct	High



Table 9. Study and participant characteristics of studies based in schools with home and community components

Author, Year	RCT	Goal: Obesity Prevention	Country	Sex*	Age Range, Years†	Grade‡	Other‡	Total N	Followup in Weeks	% Girls‡	Mean Age [Range] Years‡	Grade‡	Race‡
Angelopoulos, 2009 ¹⁴⁶	Y	N	Greece	NR	NR	NR	NR	646	65-73	55.7	10.3	5	NR
De Coen, 2012 ¹⁴⁹	Y	Y	Belgium	NR	3-6	Pre-primary-1	NR	3,241	104	50	NR	NR	NR
de Meij, 2010 ¹⁵⁰	N	N	Netherlands	NR	NR	3-8	NR	2,829	34-88	49.8	8.5	NR	Mixed, Dutch, Moroccan, Turkish, Surinam
Greening, 2011 ¹⁵¹	Y	Y	U.S.	NR	NR	NR	NR	450	34	48	8.3	NR	WNH, 40 % BNH, 80%
Jansen, 2011 ¹⁴⁸	Y	N	Netherlands	NR	6-12	3-8	NR	2,622	39	Grades 3-5, 50 Grades 6-8, 50	Grades 3-5, 7.7 Grades 6-8, 10.8	Grades 3-5, Arm 1: 52.7, Arm 2: 53; Grades 6-8, Arm 1: 47.3, Arm 2: 47	Mixed, Dutch, Moroccan, Turkish, Surinam
Millar, 2011 ¹⁵²	N	Y	Australia	NR	12-18	Secondary school	NR	2,054	NR	46.5	14.6 (1.42)	NR	NR
Naul, 2012 ¹⁵³	N	Y	Germany, Netherlands	NR	NR	NR	NR	557	208	NR	NR	NR	NR
Sanigorski, 2008 ¹⁵¹	N	Y	Australia	NR	4-12	NR	NR	1,807	104-156	51	8.3	NR	NR
Tomlin, 2012 ¹⁵⁴	N	Y	Canada	NR	NR	4-12	NR	148	28	NR	NR	NR	NR

AIAN = American Indian/Alaska Native; API = Asian Pacific Islander; BMI = Body Mass Index (in kg/m²); BNH = Black Non-Hispanic; BP = Blood Pressure; CVD = Cardiovascular Disease; Maint = Maintenance; Meds = Medications; N = No; NR = Not Reported; physical activity = Physical Activity; RCT = Randomized Controlled Trials; WNH = White Non-Hispanic; Y = Yes

*Inclusion/exclusion criteria

†Participant characteristics

Note. Weight outcomes were reported based on Johnson, 2012¹⁵⁵ for Sanigorski, 2008.¹⁵¹

Very few combined PA&D intervention studies with a school & community component world-wide

	Settings				
	School	School & Home	School & Community	School & Home & Community	Total
Programs					
Physical Activity (PA)	8	3	1	1	13
Nutrition & Diet (N&D)	1	0	1	0	2
PA & D	7	29	4	8	48
Total	16	32	6	9	63

Results of the AHRQ-Review 2013

- There is a clear shift from the mid 1980s to the 2010s in terms of additional components & including more settings for interventions:
- From only PA interventions, via combinations with diet/nutrition & screen time interventions/education
- From only school component interventions (1985-2012), via school & home components (1991-2012), via school & community components (1997-2012) to current school, home, & community based components of intervention studies (2008-2012).
- The later approach is yet more based in EU-member states than in USA and Canada according AHRQ-Review.

EU-based Reviews & Reviews of Reviews

- **Bemelmans, et al., (2014):** Overview of 71 European community-based initiatives against childhood obesity starting between 2005 and 2011. *BMC Public Health*, 14: 758
- **Mura, et al., (2015):** Physical activity interventions in schools for improving lifestyle in European Countries. *Clinical Practice & Epidemiology in Mental Health*, 11 (Suppl.1: Ms): 77

Bemelmans et al. *BMC Public Health* 2014, **14**:758
<http://www.biomedcentral.com/1471-2458/14/758>



RESEARCH ARTICLE

Open Access

Overview of 71 European community-based initiatives against childhood obesity starting between 2005 and 2011: general characteristics and reported effects

Wanda Jose Erika Bemelmans^{1,3*}, Trudy Maria Arnoldina Wijnhoven², Marieke Verschuuren¹ and João Breda²

Bemelmans et al., 2014

- Review of community based interventions (CBI)
- 278 CBI projects, 88 eligible according criteria, 71 projects included;
- **Criteria:** EU member states, implementation 2005-2011; at least 12 month of duration; school based with intersectoral collaboration at local community level (other stakeholders); process and/or effect evaluation of children/adolescents or parents

Bemelmans et al., 2014

- 96% of the 71 CBI projects implemented both environmental and individual actions/changes
- 78% did professional training (teachers/coaches)
- 70% did actions/events for parents
- 62% did social changes
- 52% did (material) environmental changes
- 13 CBIs provided evidence supporting positive effects on weight indicators/prevalence of overweight (children aged 6 to 12) with a multicomponent design of intervention (PA, nutrition, body weight)

Indicators of the design and evaluation items of the selected intervention studies

- A1= healthy diet; A2=food intake patterns; A3=fruit consumption; A4=high caloric foods
- B1=Sport exercise; B2=walking/cycling; B3= outdoor play; B4=TV watching, B5= cardiocraspiratory fitness
- C1= energy balance; C2=self esteem; C3= preventive unhealthy behaviour; C4=preventing stigmatization(obese children)
- C5= empowerment, improving coping skills

Name project (reference)	Effects	Period	Topics activities were targeted at												
			Nutrition				Physical activity					Body weight			
			A1	A.2	A3	A4	B1	B2	B3	B4	B5	C1	C2	C3	C4
General population:															
ICAPS	+	2011-14					X	X	X		X	X	X		
Movi	+	2004-06							X						
Copenhagen school child															
EPODE	+	2004-14	X	X	X	X		X	X						
Children study	+	2005-06	X		X	X			X		X	X	X		X
B-fit	+	2008-		X	X	X	X		X			X			X
GO-Overecht	+	2005-10		X	X	X					X				
GKGK/HCSC	+	2008-14	X	X	X	X	X		X	X		X	X	X	X
Jönköping county	+?	2004-	X	X	X	X	X	X	X	X	X	X	X	X	X
Overweight or obese children:															
Alive 'n' Kicking	+	2006-		X	X	X	X	X	X	X	X	X	X	X	X
Integrated Obesity Care Pathway – A Whole Systems Approach	+	2005-	X	X	X	X						X	X	X	X
MEND	+	2004-11	X	X	X	X	X	X	X	X	X	X	X	X	X
Fun 4 life	+/-	2004-	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 5: Specific objectives for nutrition, physical activity and body weight of 13 community-based interventions that provided information on effectiveness

A1 = HD, **A2** = FP, **A3** = SF, **A4** = HF **B1** = SE, **B2** = WC, **B3** = OP, **B4** = TV, **B5** = CF
C1 = EB, **C2** = SE, **C3** = PB, **C4** = SO, **C5** = IC

Source: Bemelmans (2014): revised Table 5

Bemelmans et al., 2014

- „Evidence supporting effectiveness on weight indicators is available, although the design and conduct of most of these studies were suboptimal (i.e. no control group, small sample size, not random)“ (p. 758).

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Physical Activity Interventions in Schools for Improving Lifestyle in European Countries

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Mura et al., 2015

- Review of school based physical activity interventions (SBI)
- 208 SBI projects, 114 eligible according criteria, 47 projects included;
- **Criteria:** EU member states, implementation 2000-2014; effectiveness of school-based interventions to avoid metabolic risks, age 3 to 18; **only randomized controlled trials**

Mura et al., 2015

- Different types of the projects: multicomponent (PA & diet, reducing sedentary behaviour) (n= 27 studies) vs. singular PA interventions (n= 20 studies);
- 9 of the 27 multicomponent studies included types of a PA component rather than an physical load of PA intervention; 8 studies included it with either parental support, or social/environmental changes/opportunities or enhanced PE lessons (only one project = CHILT-Study, GER)

Mura et al., 2015

- 5 of the 20 singular PA interventions extended physical PA interventions via PE lessons:
- SAMBA Study: daily 30 min.
- EDUFIT-Study: 4 x a week 55 min.
- Iceland-Study : 1 more lesson with VPA
- KISS-Study: 2 x more lessons with 10 min. VPA + 3/5 times short daily activity breaks
- Walther-Study: daily 45 min. with 15 min endurance training each day

Mura et al., 2015

• Outcome:	no. of studies
• changes of BMI:	(16 +8)
• changes body fat:	(4 +8)
• reduce of CVR:	(1 +5)
• increase of PA/decrease of sedentariness	(14+7)
• better physical fitness	(4+5)
• better physical abilities/performance	(3+2)
• change of behaviour patterns	(6 +10)
• Psycho-social benefits	(1 +3)

Mura et al., 2015

- **Results:**
- „Among the European school-based Physical Activity interventions..., a small number seemed to reach positive results in terms of decrease in BMI“ (p.98)
- „several trials achieved positive results, in particular those focused on multicomponent interventions with an actual PA component“ (p.99)
- „Physical education could be regarded as a potential setting to enhance physical activity, and to promote healthy behaviors“ (ibid).

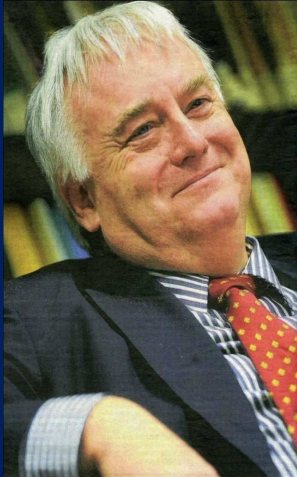
FINAL RESULTS

- Current reviews: AHRQ-Review (Wang et al. 2013, 2015), Cochrane-Reviews (Dobbins, 2013; Baker, 2015) and EU-based Reviews (Bemelmans, 2014; Mura, 2015), all documented ***mixed results about effectiveness*** of HEPA and HEPE interventions with regard to weight losses (BMI), more time spend on PA/PE , increased physical abilities or physical fitness or motor performances. Only little is known about psycho-social health benefits through PA/PE in schools. More effectiveness is recorded for primary school children (age 4 to 12) than for adolescents.

FINAL RESULTS

- **HOWEVER:**
- effectiveness and significance of school-based interventions seems to be associated with certain indicators of implementation: ***multicomponent design (more than PA); cross-sectoral approach (out-of-school sector, local network); daily load of PA or PE lessons reaching up to 60 minutes; duration of the intervention – the longer (more than 6 month) the more effective; parental involvement & volunteers assistance including social events with teachers and nutrition experts in real school life.***

Thank you for your attention!



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