



PMID	First Author	Title	Year	Study Type	CVD	RF by CQ	Country	Setting	Blinding	Int Length	Total Study Duration	Main Study Objective	Total N	Target Population	Eligibility Criteria	Patient Characteristics	Int. n at Baseline (n at Follow-up)	Int. Type	Specific Intervention	Control n at Baseline (n at Follow-up)	Specific Control	Outcomes Measured	Results/CI	Significance	Safety and Adverse Events	Additional findings	Summary	Main Reported Findings by Critical Question
8818066	McKenzie TL	School physical education: effect of the Child and Adolescent Trial for Cardiovascular Health	1996																Arm 2: School-based + family-based cardiovascular health promotion program Included home/family component in addition to food service intervention, CATCH PE, classroom curricula promoting cardiovascular health, and a tobacco curriculum and school policy ≥ 90 min/wk CATCH PE spread over minimum of 3 sessions/wk Physical education promoted enjoyment and participation in MVPA during ≥ 40% of class period									
9269880	Epstein LH	Effects of decreasing sedentary behaviors on activity choice in obese children	1997	RCT	None	Q10.13 (RF11)	USA	Clinical	None/NR	3 d	6 d	Compare methods of decreasing highly preferred sedentary behaviors and examine consequent effects on activity choice	34	Pediatric/ Young Adults	Obesity (percentage overweight greater than 20%) Boys: 14 White: 33 African American: 4 Mean SES (SD): 43.0 (12.9) Single-parent families: 6 2-parent families: 31	Arm 1: 8 (NR) Arm 2: 9 (NR) Arm 3: 8 (NR)	Behavioral	Arm 1: Positive reinforcement for not engaging in high-preference sedentary activity Positively reinforced for not engaging in their 2 high-preference sedentary activities (2 sedentary activities child engaged in for the most time during preintervention d) Earned 1 point for each min spent in high-preference sedentary activities Arm 2: Punishment for high-preference sedentary activity Given 45 points at beginning of session and lost 1 point for each min spent engaging in their 2 high-preference sedentary activities Arm 3: Restricted access to high-preference sedentary activity Given 45 points on each intervention day, regardless of activity choices and access to their 2 high-preference sedentary activities eliminated	9 (NR)	Control Arm: No contingencies on activity Reinforced for attendance and given 45 points on each intervention day, regardless of activity choices	Primary: Time spent in physical activity [# of 30 s intervals] Time spent in high-preference sedentary activity [# of 30 s intervals] Time spent in low-preference sedentary activity [# of 30 s intervals]	Primary: All 3 intervention groups more active than controls with Punishment & Reinforcement exceeding the Restriction group All 3 intervention groups spent less time on high preference sedentary activity than controls All 3 intervention groups spent less time on low preference sedentary activity than controls with time for Restriction group exceeding times for Punishment & Reinforcement groups.	S* for Punishment and Reinforcement, NS for Restriction S** for comparisons between intervention groups and controls. S** for comparisons between intervention groups and controls.	None		Reinforcing children for being active and punishing children for being inactive were as effective as removing access to targeted sedentary activities in decreasing time spent in targeted sedentary activities and increasing active time in a laboratory setting.	Q10.13. Sedentary activity can be decreased in a research setting using reward, punishment and restricted access to the selected activity.	
9539197	Saelens BE	Behavioral engineering of activity choice in obese children	1998	RCT	None	Q10.13 (RF11)	USA	Clinical	None/NR	3 d	3 d	Examine whether making sedentary activities contingent upon being physically active would increase obese children's physical activity	14	Pediatric/ Young Adults	Obesity (weighing more than 20% above the 50th percentile BMI weight and above the 85th BMI percentile) 8-12 yr Boys: 9	NR (NR)	Behavioral	Arm 1: DAY 1 (BASELINE): 90 mins of free choice of activities DAY 2 & 3: 90 mins each where targeted sedentary activities, playing video games OR watching VCR movies were contingent upon riding the stationary bike (TV for watching VCR or playing video games was only activated & remained on if & when children pedaled at ≥ 60 rpm; children controlled bike resistance. Non targeted activities of reading and drawing/coloring were freely available	NR (NR)	Control Arm: DAY 1 (BASELINE): 90 mins of free choice of activities DAY 2 & 3: 90 mins each of free choice of activities No contingencies on any activities	Primary: Activity on videotape per 30 sec interval using a time sampling coding system: Physical activity: Targeted sedentary activity: Non-targeted sedentary activity:	Primary: D 1 D 2 D 3 INT: 4.9 20.3 26.1 CON: 4.8 NS NS INT: 70.4 43.6 39.1 CON: 76.7 NS NS INT: 37.3 21.5 16.0 CON: 19.0 NS NS	S* S** S*	NR		In obese children, an intervention that made desired sedentary activity contingent on physical activity, increased time spent being active and decreased both targeted and non-targeted sedentary activity.	Q10.13. Using a desired contingency, physical activity can be increased and sedentary time decreased in obese children.	
9602197	Burke V	A controlled trial of health promotion programs in 11-year-olds using physical activity "enrichment" for higher risk children as identified by cluster analysis	1998	RCT	None	Q10 (RF4, RF5, RF8, RF9, RF11) Q13 (RF4, RF5, RF8, RF9, RF11)	Australia	Community (schools)	None/NR	20 wk	11 mo	Evaluate the short and long term benefits of a school and home based physical activity "enrichment" program for children at higher risk of CVD	800 (18 schools)	Parental/ Family/ Caregiver	11 yr Boys: 409 Children at higher risk of CVD, as identified by cluster analysis of SBP, physical fitness, BF, and TC: 29%	Arm 1: 7 schools (7 schools) Arm 2: 6 schools (6 schools)	Behavioral	Arm 1: Physical activity and nutrition program + physical activity enrichment (ENR PA) Physical activity enrichment was given to higher-risk children; children kept 7 diaries and set goals for increased physical activity Arm 2: Physical activity and nutrition program (STD PA) All students in both Arms participated in the Western Australian Schools Physical Activity and Nutrition (WASPAN) program, which included classroom lessons, 20 min/d fitness sessions, and home- and school-based activities to improve nutrition	5 schools (5 schools)	Control Arm: Standard school curriculum (CON)	Primary: Mean change in shuttle run [laps (CI)] Mean change in 1.6 km run [min (CI)] Mean change in BMI [kg/m <sup>2</sup> (CI)] Mean change in subscapular skinfolds [mm (CI)] Mean change in triceps skinfolds [mm (CI)] Mean change in TC [mmol/L (CI)] Mean change in SBP [mmHg (CI)] Mean change in DBP [mmHg (CI)] Mean sodium intake [g/d] Mean fat intake [%E]	Primary: STDPA ENR PA CON Inc Dec NC Dec Dec NC No significant difference between groups at 6 m F/U. No significant difference between groups at 6 m F/U. No significant difference between groups at 6 m F/U. Significant decrease in high risk Fs and in Ms in ENR program at 6 m F/U. No consistent changes in SBP. No consistent changes in DBP. Decreased in Ms & Fs in the ENR group. No consistent changes in fat intake. ** Results shown only in figures.	S** for Ms & Fs S for Ms & Fs. S for Ms at ENR schools only. NS at 6 m F/U. NS at 6 m F/U. NS at 6 m F/U. S for ENR group only. NS NS S at intervention end, NS at 6 m F/U. NS	None		A school-based program designed to increase activity & improve nutrition in 11 yr old children included activity enrichment for children identified as "higher" risk by cluster analysis of SBP, % body fat, fitness measures or cholesterol. Two fitness measures were improved at the end of the intervention and at 6 m F/U particularly in higher risk boys. Cholesterol decreased in high risk girls and boys in the enriched activity group at 6 m F/U. There were no other consistent changes.	Q10.13. A school-based nutrition & activity program can increase fitness and lower cholesterol at 6 m follow-up.	
10918536	Goldfield GS	Open-loop feedback to increase physical activity in obese children	2000	RCT	None	Q13 (RF11)	USA	Clinical	None/NR	30 min	4 h 30 min	Investigate whether making access to sedentary activities contingent on physical activity would increase physical activity	34	Pediatric/ Young Adults	Obesity (≥ 85th BMI percentile) Male: 32% Average SES score: 47.7 No current medical conditions, injuries or illness that prevents exercise or contraindicated treatment	Arm 1: 12 (NR) Arm 2: 13 (NR)	Behavioral	Arm 1: 1500 pedometer counts required for TV access Required subjects to accumulate 1500 pedometer counts of physical activity during 20 min activity phase to earn 10 min of access to video games or movies Arm 2: 750 pedometer counts required for TV access Required subjects to accumulate 750 pedometer counts during 20 min physical activity phase to earn 10 min of access to video games or movies	9 (NR)	Control Arm: Free access to all sedentary and physical activities	Primary: Average vector magnitude of physical activity % time at >=4.5 METS	Primary: Contingent 1500 group > Contingent 750 group (p=S*) and > Control (p=S**) Contingent 750 group > Control (p=S) Contingent 1500 group > Contingent 750 group (p=S) and > Control (p=S**) Contingent 750 group > Control (p=S)	S* S** S S S*	None		Open loop access in a research setting increased physical activity in obese children.	Q10.13. Physical activity can be increased in a research setting using open loop feedback contingency.	
10950441	Elaikim A	Adiposity, lipid levels, and brief endurance training in nonobese adolescent males	2000	RCT	None	Q10 (RF11) Q13 (RF5, RF8, RF9)	USA	Don't know	Other	5 wk	5 wk	Determine whether brief endurance-type exercise training intervention reduces body fat and improve lipid profiles in nonobese sedentary adolescent males	44	Pediatric/ Young Adults	15-17 yr Male Nonobese Sedentary Exclusions: History of chronic lung or heart disease History of smoking, drug or alcohol abuse	22 (20)	Behavioral	Arm 1: Endurance training 2-2.5 hr/d, 5 d/wk Varied physical activity including running, aerobic dance, competitive sports and occasional weightlifting	22 (18)	Control Arm: Computer workshop Participated in a computer workshop designed to improve their computer skills	Primary: Mean % body fat by skinfold [% (SE)] Mean triceps skinfold [mm (SE)] Mean biceps skinfold [mm (SE)] Mean subscapular skinfold [mm (SE)] Mean suprailiac skinfold [mm (SE)] Thigh fat volume [cm <sup>3</sup> (SE)] Mean TC [mg/dL (SE)] Mean TG [mg/dL (SE)] Mean HDL-C [mg/dL (SE)] Mean LDL-C [mg/dL (SE)] Subcutaneous abd fat %[% (SE)] Intraabdominal fat%[% (SE)] Mean weight [kg (SE)]	Primary: No change in either group No change in either group No change in either group No change in either group No change in either group No change in either group No change in either group No change in either group No change in either group No change in either group No change in either group	NS NS NS S from BL for both grps; S between grps NS S from BL for both grps; S** between grps post intervention. NS NS S from BL for both grps; NS between grps NS S from BL for both grps; S** between grps S from BL for CON, NS for INT S** between groups post intervention. NS	NR	Unexpected and unexplained increases in subcutaneous and intra-abdominal fat on MRI in the control group led to significant differences between groups at post assessment. This raises questions about the methodology.	In non-obese adolescent males, 5 wks of endurance training led to relative reductions in thigh fat, abdominal fat and subcutaneous subscapular fat compared to controls but did not produce differences in weight, other skinfold measures or lipids.	Q10.13. Endurance training in non-obese adolescent males resulted in relative reductions in body fat.	

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11818179	Ford BS	Primary care interventions to reduce television viewing in African American children	2002	RCT	None	Q10,13 (RF11)	USA	Clinical	Single	4 wk	4 wk	Evaluate whether a primary care intervention can reduce television viewing in African American children	28 families	Parental/Family/Caregiver	7-12 yr old children African American Low-income Urban	Mean age (SD): Arm 1: 9.5 yr (1.4) Control Arm: 9.6 yr (1.7)  Male (%): Arm 1: 7 Control Arm: 6  Families with college graduate (%): Arm 1: 3 (20.0) Control Arm: 2 (15.4)	15 families (12 families)	Behavioral	Arm 1: Counseling + television viewing reduction behavioral intervention  5-10 min counseling session which included discussion of potential problems associated with excessive media use and 3 brochures from American Academy of Pediatrics  Behavioral intervention included 15- to 20-min discussion about setting television budgets for year child and brochure titled <i>A Parent's Guide to Reducing Children's TV Viewing</i>  Electronic television time manager to help budget viewing time, including videotape and video game use	13 families (13 families)	Control Arm: Counseling only  5- to 10-min counseling session which included discussion of potential problems associated with excessive media use and 3 brochures from American Academy of Pediatrics	Primary: Mean children's TV, videotape and video game use [hr/wk (SD)] Overall household TV use [n (SD)]  Mean breakfast with TV on [d (SD)]  Mean dinner with TV on [d (SD)]  Mean time playing outside [hr/wk (SD)]  Mean organized physical activity [hr/wk (SD)]	Primary: Baseline to Post INT: Beh Change: -13.7(28.1) Counseling: -14.1(16.8) Beh Change: -3.4(6.8) Counseling: -2.0(7.5)  Beh Change: -1.7(2.6) Counseling: -1.1(1.9)  Beh Change: -1.4(2.7) Counseling: -0.4(1.6)  Beh Change: 1.0(5.89) Counseling: -4.65(9.43)  Beh Change: 2.50(5.93) Counseling: -3.58(4.71)	NS S NS NS NS NS NS NS	None	Study is a pilot feasibility project and is not powered for significant results for all measured variables.	A community clinic intervention in 7- to 12-year-old children employed counseling only vs counseling and behavioral change therapy with an electronic TV time manager. Study is a pilot feasibility project and results at 4-week FU show decreased overall screen time and a trend towards fewer meals in front of the TV.	Q10,13. Sedentary screen time can be decreased using a primary care based intervention with an electronic TV time manager		
12649058	van Beurden E	Can we skill and activate children through primary school physical education lessons? "Move + Groove It" - a collaborative health promotion intervention	2003	RCT	None	Q10,13 (RF11)	Australia	Community	None/NR	1 yr	1 yr	Assess the potential to improve child fundamental movement skills and increase physical activity through primary school intervention	1045 (18 schools)	Pediatric/Young Adults	Rural primary schools Children in school years 3 and 4	7-10 yr Boys: 53%	9 schools (NR)	Behavioral	Arm 1: Physical education program  "Move it Groove it" health promotion intervention  School project teams, a buddy program, professional development for teachers through 4 workshops, a project website for teachers, and funding for the purchase of equipment	9 schools (NR)	Control Arm: No specialized physical education program	Primary: Time in 4-5 METS (moderate intensity activity) [%]  Secondary: Movement skills	Primary: 4.5% increase in intervention group  Secondary: Significant increases in all domains	NS (p=07)  S** for all movement skills combined.	None	None	This well done school based PA intervention increased time spent in MVPA and improved movement skills although the former did not meet significance.	Q10,13 A PA skills curriculum can teach PA skills and may result in modest increase in PA.		
12713212	Robinson TN	Dance and reducing television viewing to prevent weight gain in African-American girls: the Stanford GEMS pilot study	2003	RCT	None	Q10,13 (RF8, RF9, RF11)	USA	Mult settings	Single	12 wk	12 wk	Test the feasibility, acceptability, and potential efficacy of after-school dance classes and a family-based intervention to reduce television viewing, thereby reducing weight gain among African-American girls	61	Parental/Family/Caregiver	8-10 yr Girls African-American (as identified by parent/guardian) BMI ≥ 50th percentile for age and/or ≥ 1 overweight parent/guardian (BMI ≥ 25 kg/m <sup>2</sup> ) Low-income family Exclusions: Diagnosed with medical condition affecting growth Taking medications affecting growth	Mean age (SD): Arm 1: 9.5 yr (0.8) Control Arm: 9.5 yr (0.9)  Highest parent/caregiver level of education: Some high school: Arm 1: 0 Control Arm: 3 High school graduate or GED: Arm 1: 8 Control Arm: 6 Some college or technical school: Arm 1: 15 Control Arm: 17 College graduate: Arm 1: 5 Control Arm: 7  Family owns home: Arm 1: 4 Control Arm: 8	28 (25)	Behavioral	Arm 1: After-school dance classes + 5 home-based lessons to reduce sedentary behavior  Girls Health Enrichment Multi-site Studies (GEMS) dance classes offered 5 d/wk at 3 community centers for 3 mo  Each session up to 2.5 hr, including 45-60 min MVPA in the form of dance and a healthful snack  Sisters Taking Action to Reduce Television (START) intervention consisted of 5 lessons during home visits over 12 wk	33 (27)	Control Arm: Newsletters and health education lectures	Primary: Mean BMI [kg/m <sup>2</sup> (SD)] Mean waist circumference [cm (SD)] Mean physical activity noon-6pm [average CSA counts/min (SD)] Mean MVPA noon-6pm [average min (SD)] Mean self-reported previous d MVPA [min (SD)] Mean TV, videotape and video game use [hr/wk (SD)] Mean total household TV use [0-4 scale (SD)] Mean time spent eating breakfast with TV on [d/wk (SD)] Mean time spent eating dinner with TV on [d/wk (SD)] Mean total dietary calorie intake [kcal/d (SD)]	Primary: INT - CON: -0.32(CI: -0.77,0.12) INT - CON: -0.63 (CI: -1.92,0.67) INT - CON: 55.1 (CI: -115.6, 225.8) INT - CON: 7.3 (CI: -25.8, 40.4) INT - CON: 9.2 (CI: -11.2, 29.6) INT - CON: -4.96 (CI: -11.41, 1.49) INT - CON: -0.56 (CI: -0.95, -0.17) INT - CON: -0.09 (CI: -1.52, 1.34) INT - CON: -1.60 (CI: -2.99, -0.21) INT - CON: 84.3 (CI: -201.5, 370.1)	NS NS NS NS NS NS S* NS S NS	None	This is a pilot study and was not powered to measure significant differences in all outcome measures.	An after-school dance program in 8-10 yr old AA girls was successful in increasing activity, decreasing screen time and improving obesity measures.	An after school dance program in 8-10 yr old AA girls was successful in increasing activity, decreasing screen time and improving obesity measures.		
12713212	Robinson TN	Dance and reducing television viewing to prevent weight gain in African-American girls: the Stanford GEMS pilot study	2003																											
12929897	Kelder SH	Long-term implementation of the CATCH physical education program	2003	RCT	None	Q11 (RF11)	USA	Mult settings	None/NR	3 yr	8 yr	To evaluate whether the CATCH activity intervention was sustained 5 y post-intervention.	96 schools (All 56 CATCH intervention schools, 20 (of 40) CATCH control schools and 12 new schools.	Pediatric/Young Adults	3rd-5th grade students Randomly selected 4 students in each classroom for observation Not reported how new school controls were selected	NR	56 schools (56 schools) 401 PE lessons observed 41 PE specialist questionnaires 572 classroom teacher questionnaires	Behavioral	Arm 1: CATCH intervention(FI)  Classroom curricula and school environmental modifications related to food consumption, physical activity, and tobacco use, as well as family and home-based programs to complement the school-based activities  CATCH PE goal was to involve students in MVPA at least 40% of class time during a minimum of 3 physical education classes per wk for 30 to 40 min per class	32 schools In the 20 former (CON) schools, 153 PE lessons observed+16 PE specialist questionnaires+191 classroom teacher questionnaires In the 12 unexposed new control schools, 91 PE lessons observed + 11 PE specialist questionnaires + 127 classroom teacher questionnaires.	Control Arm: No CATCH intervention.  At completion of original study in 1994, former control schools were provided with all CATCH PE curricula and materials, and 1 d of training was made available (FC)  12 schools with no prior exposure to CATCH were used as a reference group (UC)	Primary: SOFIT instrument assessment of: % OF TIME STUDENTS WERE "VERY ACTIVE" DURING PE. % OF TIME STUDENTS WERE "VERY ACTIVE" +/- WALKING DURING PE ESTIMATED CLASS ENERGY EXPENDITURE [kcal/kg (SE)]; PROPORTION OF LESSON MINUTES ALLOCATED TO EACH OF THE SEVEN LESSON CONTEXTS  SCHOOL STAFF QUESTIONNAIRES & INDEPTH INTERVIEWS	Primary: No difference between groups.  No difference between groups.  No difference between groups.  No differences between original CATCH schools & CATCH control schools but CATCH intervention schools significantly better than new control schools on 5 of 7 PE lesson characteristics.  CATCH intervention schools significantly more likely to have CATCH materials, have used CATCH materials, received CATCH training than CATCH control schools. No significant differences in school support or barriers for PE.	NS NS NS NS S	There was a significant increase in student MVPA in all 3 school settings with CATCH schools meeting 2010 goals and control schools almost achieving this.	Former CATCH intervention schools did not differ significantly from former CATCH control schools or previously studied schools in any observational measure of physical activity during PE, lesson content or PE support/barriers. Intervention schools were significantly better than unstudied controls on measures of lesson quality and significantly better than former controls on having, using and being trained on CATCH materials.	Q11. A school based intervention that increased activity during PE class was unsuccessful when compared with control schools 5 y after completion of the intervention. However, MVPA increased overall in all school settings over the 5 year interval.			
14757609	Dennison BA	An intervention to reduce television viewing by preschool children	2004	RCT	None	Q5 (RF11) Q10,13 (RF8, RF11)	USA	Mult settings	None/NR	7 wk	1 yr	Develop and evaluate an intervention to reduce television viewing by preschool children	176 (16 centers)	Parental/Family/Caregiver	2.5-5.5 yr	Mean age (SEM): Arm 1: 3.9 yr (0.07) Control Arm: 4.0 yr (0.10)  Males: 38 White: 74  Maternal education: High school: 9 Some college: 8 College degree: 20 Postgraduate degree: 27 Paternal education: High school: 18 Some college: 21 College degree: 20 Postgraduate degree: 16  Maternal work status: Not working: 16 Part-time: 17 Full-time: 42 Paternal work status: Not working: 2 Part-time: 3 Full-time: 70	93 (90) 8 centers (8 centers)	Behavioral	Arm 1: Reduced TV viewing promotion program  20-min session per wk for 7 wks designed to reduce television viewing as part of a 32 wk health promotion curriculum	83 (73) 8 centers (8 centers)	Control Arm: Safety and injury prevention program  Curriculum, materials and ideas for activities about health and safety provided to day care or preschool staff, information and materials for at-home activities mailed to parents	Primary: Mean change in TV/video viewing [hr/d (SEM)] Weekdays: Saturday: Sunday:  Mean change in children viewing ≥ 2 hr/d [% (SEM)]  Mean change in computer/video game playing [hr/d (SEM)] Weekdays: Saturday: Sunday:  Secondary: Mean change in weight [kg/yr (SEM)]  Mean change in BMI [kg/m <sup>2</sup> /yr (SEM)]  Mean change in standardized BMI [SD/yr (SEM)]  Mean change in triceps skinfold [mm/yr (SEM)]	Primary INT vs CON: -0.37(0.15) vs +0.25(0.17) -0.50(0.25) vs 0.13(0.27) -0.78(0.22) vs 0.21(0.26) INT: -15.6(6.6) vs CON:+5.9(7.2)  NO SIGNIFICANT CHANGE IN ANY OTHER OUTCOME.	S NS S* S NS	None	A preschool intervention with take home components designed to decrease TV viewing was successful at 1 y FU.	Q10,13. TV viewing time in preschool children can be decreased.			

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15064595	Roemmich JN	Open-loop feedback increases physical activity of youth	2004	RCT	None	Q10,13 (RF11)	USA	Clinical	None/NR	6 wk	6 wk	Evaluate the influence of open-loop feedback and reinforcement on physical activity and television time	18 families	Parental/Family/Caregiver	Child with BMI < 90th percentile No conditions that would limit physical activity Watched ≥ 15 hr/wk of television including VCR use and video game playing	Mean age (SE): Arm 1: 11.0 yr (0.4) Control Arm: 10.9 yr (0.5) Boys: Arm 1: 7 Control Arm: 4	11 families (NR)	Behavioral	Arm 1: Open-loop feedback + reinforcement Accumulating physical activity counts give subjects access to TV time, controlled by a TV allowance device (400 counts = 60 min of TV) Physical activity during current wk was used to determine TV time for following wk Children given goal of 400 activity counts per d Families met w/ky with a case manager to problem solve issues and highlight physical activity goals MVPA was described in terms of physical cues, perceived exertion and list of activities that met criterion of being at least 3 METs in intensity Families received information on proper use of reinforcement system	7 families (NR)	Control Arm: No feedback or reinforcement + free access to TV Accelerometer display was turned off so there was no feedback about physical activity, although monitor was still recording data TV allowance units were not placed in the home Children given goal of 60 min/d of MVPA Families met w/ky with a case manager to problem solve issues and highlight physical activity goals MVPA was described in terms of physical cues, perceived exertion and list of activities that met criterion of being at least 3 METs in intensity Families received information on proper use of reinforcement system	Primary: Physical activity [counts/d] Physical activity [min/d] Television time [min/d] Change in BMI z-score	Primary: Increased Increased No change No change * Results shown only as graphs.	S S NS NS	None	None	Very small study group.	This interesting small study showing that open loop contingency using TV increases PA without increasing TV time in prepubertal children.	Q10,13. Physical activity can be increased through contingency.
15099173	Prochaska JJ	A randomized controlled trial of single versus multiple health behavior change promoting physical activity and nutrition among adolescents	2004	RCT	None	Q10 (RF9, RF11) Q13 (RF9, RF11)	USA	Clinical	Single	30 min	Oct 1999 - June 2000	Compare interventions targeting physical activity and nutrition concurrently versus physical activity alone	138	Pediatric/Young Adults	Middle school students Ability to engage in physical activity	Mean age (SD): 12.1 yr (0.9) Boys: 48 White, non Hispanic: Arm 1: 19 (41%) Arm 2: 11 (24%) Control Arm: 8 (17%) African American: Arm 1: 3 (7%) Arm 2: 4 (9%) Control Arm: 3 (7%) White, Hispanic: Arm 1: 1 (2%) Arm 2: 3 (7%) Control Arm: 3 (7%) Asian-Pacific Islander: Arm 1: 9 (20%) Arm 2: 12 (26%) Control Arm: 11 (24%)	Arm 1: 46 (NR) Arm 2: 46 (NR) attrition was 2% total, not significantly different between groups	Behavioral	Arm 1: Physical activity only (PA) Single behavior intervention Arm 2: Physical activity + nutrition (fruit and vegetable consumption)(PAN) Multibehavioral intervention Arm 1 and Arm 2 received tailored feedback from the assessment and created individualized behavior change or relapse prevention plans as appropriate. This was a 1 time exposure lasting up to 30 mins. The intervention was a modified version of the Patient-Centered Assessment and Counseling for Exercise Plus Nutrition (PACE+) program	46 (NR)	Control Arm: No treatment (CON)	Primary: Mean physical activity [average minutes per day of moderate to vigorous physical activity] from one week of accelerometer monitoring Mean fruit and vegetable [servings/d] from 3-day food records	Primary: PA: 9x36 PAN: 2+25 CON: -3x50 M: -14;33 F: -9;29 -15;28 No change in F&V servings/d in any group.	S for PA + PAN vs CON NS	None		A school-based intervention aimed at assessing the effectiveness of addressing single (activity) vs multiple (activity + nutrition) health behaviors was only successful in increasing activity in males. There was no outcome difference between interventions in males and no change in nutrition in males or females.	Q10,13. Among boys, a school-based program increased physical activity. Among girls, there were no significant intervention effects. There was no significant change in F&V intake in response to the nutrition intervention.	
15657024	Epstein LH	The value of sedentary alternatives influences child physical activity choice	2004	RCT	None	Q13 (RF11)	USA	Clinical	None/NR	75 min	75 min	Evaluate the influence of the value of sedentary alternatives on the choice to be physically active or sedentary	30	Pediatric/Young Adults	8-12 yr Non-obese Exclusions: Child did not have at least a moderate liking (≥ 6 on a 9-point Likert scale) for at least 1 of the sedentary and physical activities	Mean age (SD): 10.51 yr (1.26) Boys: 15 White: 77.4% African American: 12.9% Native American or Alaskan Native: 6.5% Hispanic American: 3.2% Mean Hollingshead 4-factor index of SES (SD): Arm 1: 53.80 (12.68) Arm 2: 44.55 (11.53) Arm 3: 54.55 (10.99)	30 (NR)	Behavioral	Arm 1: Choice between 4 active alternatives or 4 sedentary alternatives Arm 2: Choice between 4 active alternatives or least favorite sedentary activity Arm 3: Choice between 4 active alternatives or favorite sedentary activity Children in each arm took a computer task (5 successive games where each point was worth 30 s of time in the activity room; Choice to work on either of 2 screens - 1 to earn points for sedentary activity and 1 to earn points for physical activity) and a behavioral-choice questionnaire (asked how many times they would be willing to press the button on a hand counter to do 10 min of sedentary activity or 10 min of physical activity)	N/A	N/A	Mean computer task responses (SEM) Questionnaire switch points responses	Children's options for sedentary activities affected their willingness to participate in physical activity. When only less liked sedentary activities were available, children were less likely to choose the sedentary behavior and more likely to choose the active alternative. * Results shown only as graphs.	S between groups for switch point from sedentary to active selection.	None		To reduce time spent in targeted sedentary activities, study showed that reinforcing children for reducing time being inactive and punishing children for being inactive were as successful as removing access to targeted inactive behaviors.	Q10,13. Physical activity time can be increased by offering less favored sedentary options.	
16118370	Pate RR	Promotion of physical activity among high-school girls: a randomized controlled trial	2005	RCT	None	Q10,13 (RF11)	USA	Community (schools)	None/NR	1 school yr	1 yr	Examine the effects of a comprehensive school-based intervention on physical activity among high-school girls	2,744 (24 schools)	Pediatric/Young Adults	8th grade Girls	Mean age (SD): Arm 1: 13.6 (0.7) Control Arm: 13.6 (0.8) African American: 48.7% White: 46.7%	1,523 (863) 12 schools (NR)	Behavioral	Arm 1: LEAP Physical education program Lifestyle Education for Activity Program (LEAP) designed to change instructional practices and school environment to increase support for physical activity among girls Included physical education, health education, school environment, school health services, faculty/staff health promotion, and family/community involvement components Included gender-specific, girl-friendly, choice-based instructional program in which activities that girls typically enjoy (e.g., aerobics, dance, walking, self-defense, martial arts, weight training) were offered in addition to competitive sports and traditional physical education activities	1,221 (741) 12 schools (NR)	Control Arm: No treatment	Primary: ≥ 1 blocks (30 min each) MVPA/d [%] (SE); Adjusted mean: Secondary: ≥ 2 blocks (30 min each) of VPA/d [%] (SE); Adjusted mean: BMI ≥ 85th percentile [%] (SE); Adjusted mean: BMI ≥ 95th percentile [%] (SE); Adjusted mean:	Primary: INT: 44.5%(2.6) vs CON:36.4%(2.9) Secondary: No significant difference between groups for any other variable.	S	None		A school-based intervention in adolescent girls which addressed the content of PE classes and the physical activity environment of the school successfully increased participation in MVPA. There was no change in BMI.	Q10,13. A school-based intervention can increase MVPA in adolescent females.	
16128481	Hopper CA	The effects of a family fitness program on the physical activity and nutrition behaviors of third-grade children	2005	RCT	None	Q10,13 (RF5, RF8, RF9, RF11)	USA	Multi settings	None/NR	20 wk 10 wk in fall semester, 10 wk in spring semester	60 wk	Investigate the efficacy of a school-based exercise and nutrition program with a parental component	238 (6 schools)	Parental/Family/Caregiver	3rd grade children from schools in a predominantly rural area	Mean age (SD): 102.82 mo (7.80) Boys: 121 Caucasian: 83% Native American: 5% Asian: 5% Hispanic: 5% African American: 2%	142 (NR) 3 schools (3 schools)	Behavioral	Arm 1: Physical education + nutrition education + home program School-based physical education (3-30 min/wk lessons) emphasized physical activity and fitness objectives in Healthy People 2000 Nutrition education (2-30 min/wk lessons) emphasized impact of nutrition on heart health, reading labels and other consumer tips Home program requested parents and children to complete activities and earn points for exercise and nutrition activities	96 (NR) 3 schools (3 schools)	Control Arm: Traditional physical education + nutrition education program	Primary: Nutrition knowledge Total fat intake [g] Mean weight [kg] Mean BMI [kg/m <sup>2</sup> ] Mean skinfold sum [mm] Mean blood cholesterol [mg/dL] Mean energy intake [kcal] Mean protein intake [g] Mean CHO intake [g] Mean fiber intake [g] Mean saturated fat intake [g] Mean cholesterol intake [mg] Mean sodium intake [mg] Mean mile run time [sec] Mean CHO intake [%E] Mean fat intake [%E]	Primary: INT: 11.61 to 15.41; CON: 12.36 to 13.43 INT: 59.67 to 57.05; CON:64.50 to 64.66 No significant change for any of these variables	S between groups S between groups NS for all these assessments	None		A school-based exercise and nutrition program with a parental component aimed at 3rd graders showed no (+) outcomes. Study may have been underpowered.	Q10,13. A school-based exercise and nutrition program with a parental component aimed at 3rd graders showed no (+) physiologic outcomes.	



PMID	First Author	Title	Year	Study Type	CVD	RF by CQ	Country	Setting	Blinding	Int Length	Total Study Duration	Main Study Objective	Total N	Target Population	Eligibility Criteria	Patient Characteristics	Int. n at Baseline (n at Follow-up)	Int. Type	Specific Intervention	Control n at Baseline (n at Follow-up)	Specific Control	Outcomes Measured	Results/CI	Significance	Safety and Adverse Events	Additional findings	Summary	Main Reported Findings by Critical Question			
16138517	Rooney BL	Growing healthy families: family use of pedometers to increase physical activity and slow the rate of obesity	2005	RCT	None	Q10,13 (RF8, RF11)	USA	Home	None/NR	12 wk	1 yr	Determine if wearing a pedometer affects weight, BMI, or mediators of physical activity among families	353 (98 families)	Parental/Family/Caregiver	At least one child 5-12 yr with BMI > 84th percentile At least one adult within the family required to participate	Mean age: Arm 1: 10.1 yr Arm 2: 9.4 yr Control Arm: 9.6 yr  Males: Arm 1: 52% Arm 2: 44% Control Arm: 50%  White: 97%  Parent marital status (% married): Arm 1: 86% Arm 2: 88% Control Arm: 96%  Obese or severely obese parents: 53%	Arm 1: NR (112, 30 families) Arm 2: NR (104, 28 families)	Behavioral	Arm 1: Pedometer + education (P+ E) Instructed to walk 10,000 steps daily for 12 wk  Required to attend 6 1-hr bi-weekly sessions concerning nutrition, physical activity, or other parenting issues  Arm 2: Pedometer only (P) Instructed to walk 10,000 steps daily for 12 wk  Both arms received bi-weekly newsletter that complemented the educational theme and included fun activity tips	NR (100, 29 families)	Control Arm: No pedometer or education	<b>Primary:</b> Mean change in BMI percentile (%)  <b>Secondary:</b> % of days with ped steps>10,000 % of wks with ped steps > 70,000 Mean change in parent weight (lb) Mean change in percent of hr/wk in sedentary activity (%)  Mean change in attitude about exercise	<b>Primary:</b> P+E/P: +0.31 vs CON: -1.32  <b>Secondary:</b> P+E: 53%, P:43% P+E: 55%, P:44% P+E/P:-0.95 vs CON:-0.19  At post test, sedentary behavior increased for arm 1 and decreased for arm 2 and controls, decreased in all groups at 9 mos. Decreases were greatest in the control group at both times.  Normative attitudes about exercise improved at post int and 9 mos in arm 1. Improved attitude greatest in P+E grp at both times.  Self efficacy unchanged at post and 9 mos in all grps	NS between groups.  S  S  NS  S  S post program; NS at 9 mos  NS	NR	52% of children reported they did not wear pedometers to promote activity awareness, increase daily activity and slow the development of obesity.	A family-based intervention uses pedometers to promote activity awareness, increase daily activity and slow the development of obesity.	Q10,13. Pedometers with an accompanying educational intervention did not result in significant improvement in BMI percentile over 9 months.			
16458955	Jago R	Fit for Life Boy Scout badge: outcome evaluation of a troop and Internet intervention	2006	RCT	None	Q10,13 (RF8, RF11)	USA	Community (other)	None	9 wk	8 mo, 1 wk	Assess both the immediate and longer-term effect of a Boy-Scout-based physical activity intervention using limited troop time and an Internet program targeting physical activity self-efficacy and preference change	473	Pediatric/Young Adults	10-14 yr Boys	Mean age (SE): Arm 1: 13 yr (0.1) Control Arm: 13 yr (0.1)  Anglo-American: Arm 1: 180 Control Arm: 165 African-American: Arm 1: 6 Control Arm: 11 Hispanic: Arm 1: 35 Control Arm: 29 Mixed/other race: Arm 1: 19 Control Arm: 26  Highest household education: High school graduate or less: Arm 1: 17 Control Arm: 10 Some college/technical education: Arm 1: 60 Control Arm: 50 College degree: Arm 1: 76 Control Arm: 91 Postgraduate education: Arm 1: 84 Control Arm: 79	240 (209)	Behavioral	Arm 1: Physical activity intervention  The "Fit for Life" physical activity badge included skill building activities at troop meetings and Internet-based role modeling, goal setting, goal review and problem-solving  20-min physical activity sessions during troop meetings; participants were encouraged to engage in these activities outside of the troop meetings and were provided with a Boy Scout "drills booklet"  Participants were asked to log onto the study website ≥ 2 times/wk	233 (208)	Control Arm: "Mirror image" fruit and vegetable intervention	Mean sedentary activity [min/d] (SE)  Mean light physical activity [min/d] (SE)  Mean MVPA [min/d] (SE)  Mean counts/min as measured by accelerometer (SE)  Mean physical activity self-efficacy (SE)  Mean physical activity preferences (SE)  Mean BMI [kg/m <sup>2</sup> ] (SE)  Mean BMI percentile  Mean triceps skinfold [mm] (SE)	9 weeks[Post intervention] Sp INT: 908.4(6.2) to 896.3(6.3) Sp CON: 906.8(7.1) to 901.9(6.9) Fall INT: 919.5(5.4) to 925.9(4.9) Fall CON: 926.8(5.2) to 930.1(4.8)  Sp INT: 143.6(4.9) to 155.9(4.9) Sp CON: 145.0(5.5) to 152.3(5.4) Fall INT: 136.7(4.2) to 129.9(3.9) Fall CON: 132.1(4.1) to 132.0(3.5)  No change in INT or CON, spring or fall.  No change in INT or CON, spring or fall.  Increased in all groups at 9 w and 6m.  No change at 9 w in any group; increased in all groups at 6 m.  No change at 9 w in any group; increased in all groups at 6 m.  Sp INT:17.8(0.8) to 14.8(0.8) Sp CON:16.0(0.9) to 17.3(0.9) Fall INT: 16.0(0.8) to 16.1(0.8) Fall CON: 15.4(0.6) to 14.0(0.6)	S NS NS  S* NS NS NS  NS  NS  NS  S** NS NS NS	None	At 9 mos post intervention, there were no significant differences in any group.  Continued participation in the study was associated with increased parental education and lower BMI.	The Fit for Life Boy Scout badge resulted in increased light intensity activity and a trend towards decreased sedentary behavior in spring participants immediately post intervention. This was not sustained at 9 mo F/U.	Q10,13. The Fit for Life Boy Scout badge resulted in increased light intensity activity and a trend towards decreased sedentary behavior in spring participants immediately post intervention. This was not sustained at 9 mo F/U.			
16461867	Patrick K	Randomized controlled trial of a primary care and home-based intervention for physical activity and nutrition behaviors: PACE+ for adolescents	2006	RCT	None	Q10,13 (RF8, RF9, RF11)	USA	Multi settings	None/NR	1 yr	1 yr	Evaluate a health care-based intervention to improve physical activity and nutrition behavior	819	Parental/Family/Caregiver	11-15 yr Exclusions: Boys: Arm 1: 202 Control Arm: 179  Asian or Pacific Islander: 28 African American: 54 Native American: 6 Hispanic: 107 White: 478 Multi-ethnic or other ethnicity: 148  Highest household education level: No high school degree to associate's-level degree: 289 Bachelor's-level degree: 238 Graduate or professional degree: 294	424 (356)	Behavioral	Arm 1: Computer assisted diet and physical activity assessment and goal setting + counseling  Patient-centered Assessment and Counseling for Exercise + Nutrition Intervention (PACE+)  Primary care, office-based, computer expert system to assess nutrition target behaviors, physical activity target behaviors, and sedentary behaviors  Printed manual and telephone counseling calls (10-15 min each): low dose =0-8 calls; high dose = 8-11 calls.  Parent intervention to help parents encourage behavior change attempts through praise, active support, and positive role modeling	395 (334)	Control Arm: Sun exposure protection + counseling  SunSmart sun protection behavior program  Primary care, office-based, computer assessment of sun protection behaviors resulting in stage-based recommendations for improvement such as wearing protective clothing and use of sunscreen  Counseling telephone calls at 3 mo and 6 mo, followed by mailed feedback report and tip sheet to encourage continued sun protection behavior	<b>Primary:</b> ACTIVITY CHANGE: Mean sedentary behavior [hr/d] (SD)  Mean MVPA recall [min/wk] (SD)  Mean active time [hr/wk] (SD)  Participants meeting recommended s 2 hr/d of TV viewing [%] (95% CI)  Participants meeting recommended physical activity d/wk [%] (95% CI)  Mean BMI z-score (SE)  Mean fruit and vegetable intake [servings/d] (SD)  Calories from fat [%] (SD)	<b>Primary:</b> ACTIVITY CHANGE: F INT: 4.3(3.4) to 3.4(2.6) F CON: 4.2(3.4) to 4.4(3.7) M INT: 4.2(3.7) to 3.2(2.6) M CON: 4.2(2.8) to 4.3(3.5)  No significant change, M or F  F: No significant change M INT: 4.1(2.0) to 4.4(2.1) M CON: 3.8(2.1) to 3.8(2.1)  F: No significant difference M RR: 1.47(CI:1.19,1.75)  No significant difference, M or F  M: No significant change F INT: 3.5(1.5) to 4.2(1.8) F CON: 3.5(1.8) to 3.5(1.7)	S** between grps  S** between grps  NS S** between grps  NS  S  NS  NS  NS	None	All other activity outcome measures and diet outcomes improved but changes were not significant.	A primary care office-based intervention used initial brief health care provider counseling followed by a 12 month computer-assisted follow-up mail & telephone counseling. There are differences in response between males and females.	Q10,13. Active & sedentary behaviors and diet can be changed in adolescents using a primary care office-based intervention combined with computer-assisted follow-up mail & telephone counseling. There are differences in response between males and females.				
16461867	Patrick K	Randomized controlled trial of a primary care and home-based intervention for physical activity and nutrition behaviors: PACE+ for adolescents	2006																												
16523185	Simon C	ICAPS: a multilevel program to improve physical activity in adolescents	2006	RCT	None	Q10,13 (RF8, RF11)	France	Multi settings	None/NR	6 mo	4 school yr	Evaluate the feasibility and efficacy of the ICAPS program (Intervention Centred on Adolescents' Physical Activity and Sedentary Behaviour), which is aimed at preventing excessive weight gain and cardiovascular risk in adolescents by promoting physical activity	954 (6 schools)	Pediatric/Young Adults	Middle school students Ability to engage in physical activity Willing to have a medical exam and to answer questionnaires	Mean age: 11.6(0.7) yrs: 46.3% male 23.6% overweight	475 (NR) 4 schools (NR)	Behavioral	Arm 1: Education focusing on physical activity and sedentary behaviors (INT)  Program aimed to change knowledge, attitudes and motivation towards physical activity by means of information, debates, and through the physical activity sessions offered  Parents, peers, teachers, and physical activity instructors were encouraged to provide social support for enhanced physical activity  Environmental, structural, and institutional conditions were made optimal for physical activity (e.g., by securing low-cost or free admission to pools)	479 (NR) 4 schools (NR)	Control Arm: Usual school curriculum and physical education classes (CON)	<b>Primary:</b> Mean proportion of time leisure organised physical activity [%]  Mean proportion of time devoted to high sedentary behavior (TV/computer and video games > 3 hr/d) [%]	<b>Primary:</b> F INT: 59 to 83%; F CON:48 to 50% M INT: 69 to 81%; M CON:67 to 66%  F INT: 24 to 17%; CON: 24 to 28% M INT: 44 to 41%; CON:34 to 48%	S* S*  S** S**	None	Only 6 month data reported to this time. Not all outcome data reported (e.g. no BMI data)  Girls improved self efficacy and intention towards activity; no change from BL in males.	A school based program targeting 12 years olds can increase time spent in physical activity and decrease sedentary time at short term F/U.	Q10,13. A school based program targeting 12 years olds can increase time spent in physical activity and decrease sedentary time at short term F/U.			
17144438	Southard DR	Promoting physical activity in children with MetaKenkoh	2006	RCT	None	Q10,13 (RF11)	USA	Clinical	None/NR	1 wk preliminary data reported Intervention intended to be for 4 wk	4 mo	Evaluate the potential for activity-contingent games to facilitate increased physical activity in children	81	Pediatric/Young Adults		NR (38)	Behavioral	Arm 1: Activity-contingent game play  Internet-based game MetaKenkoh designed to promote physical activity and healthier food choices  In order to play, children must wear a pedometer to record their real-life physical activity - children's steps taken during the day are converted into "energy" the energy unit needed to play the game  Other key features of the game include fitness promotion theme, educational components, adventure game format, and parental involvement	NR (39)	Control Arm: No intervention  Monitored only	<b>Primary:</b> Mean steps/d [n] (SE)	<b>Primary:</b> Only post-hoc subgroup outcomes were reported and only as a figure.  In underweight and normal weight children, baseline of intervention group steps per day was less than controls.  From baseline to 1 week, slope of intervention group steps per day is positive and slope of control group is negative.  Among overweight and at-risk of overweight, baseline steps per day greater among intervention group. From baseline to 1 week slope of both groups positive and approximately parallel	<b>Primary:</b> No significance data provided.	NR	Preliminary data with small sample size.	A computer game-based intervention designed to increase activity in 9 - 11 y olds is based on using points gained from routine activity to gain access to the game. This report is of preliminary data only.	Q10,13. Activity contingent games have the potential to increase children's physical activity. This conclusion is not supported by the preliminary results of this study.				

PMID	First Author	Title	Year	Study Type	CVD	RF by CQ	Country	Setting	Blinding	Int Length	Total Study Duration	Main Study Objective	Total N	Target Population	Eligibility Criteria	Patient Characteristics	Int. n at Baseline (n at Follow-up)	Int. Type	Specific Intervention	Control n at Baseline (n at Follow-up)	Specific Control	Outcomes Measured	Results/CI	Significance	Safety and Adverse Events	Additional findings	Summary	Main Reported Findings by Critical Question	
17146023	Young DR	Effects of a life skills intervention for increasing physical activity in adolescent girls	2006	RCT	None	Q10,13 (RF4, RF5, RF8, RF11)	USA	Community (schools)	None	8 mo	8 mo	To evaluate the effects of a life skills-oriented physical activity intervention for increasing overall physical activity in high school-aged girls	221	Pediatric/ Young Adults	Girls 8th grade Enrolled in 2 consecutive semesters of required PE Exclusions: Being excused from meeting Maryland state PE requirements	Mean age (SD): 13.8 yr (0.5) African American: 83.0% Mothers with > high school education: 56.3%	116 (111)	Behavioral	Arm 1: Alternative PE class 1 semester of individual sports and 1 semester of team sports taught 5 d/wk Taught and reinforced goal setting, problem-solving barriers, communication skills, reinforcement of goal achievement, and learning from role models Change in participants watching ≥ 3 h TV/d during school days [%] Skills were taught using class lectures and discussions, small-group discussions, and homework activities Students were encouraged to keep weekly exercise logs Written tests focused on health-related physical activity, fitness concepts and behavioral skills Family support component consisting of a family workshop, monthly newsletters, and adult-child homework assignments	105 (99)	Control Arm: Standard PE class 1 semester of individual sports and 1 semester of team sports Parents of participants received monthly newsletters that included topics of general health interest as well as an article about the PE class content that month	Primary: Mean estimated daily energy expenditure [kcal/kg/d (SD)] Secondary: Mean change in submaximal HR [bpm (SE)] Mean change in participants watching ≥ 3 h TV/d during school days [%] Mean waist-hip ratio (SD) Mean SBP [mmHg (SD)] Mean DBP [mmHg (SD)] Mean HDL-C [mg/dL (SD)] Change in participants watching ≥ 3 h of internet use or videogame playing/d during school days [%] Change in participants engaging in ≥ 3 h of internet use or videogame playing/d during weekends [%]	Primary: INT: 34.6(3.2) to 43.2(2.9) vs CON: 34.9(2.7) to 34.2(2.1) Secondary: INT: -7.1(1.8) vs CON: -7.4(2.0) INT: -5.3 vs CON: 0 INT: 0.79(0.08) to 0.77(0.06) vs CON: 0.78(0.07) to 0.77(0.08) INT: 109.4(10.4) to 108.3(11.1) vs CON: 110.3(12.0) to 106.8(10.0) INT: 59.5(5.9) to 57.7(7.2) vs CON: 58.8(7.4) INT: 52.2(12.0) to 54.0(12.4) vs CON: 52.7(10.7) to 55.7(10.3) No difference within or between groups for any of these variables.	NS within and between groups S within both groups; NS between groups S* for INT,S for CON within group; NS between groups p=.09 for INT, S* for CON within group; NS between groups S for INT, S* for CON; NS between groups NS within & between groups. NS within & between groups.	None	Both groups improved cardiorespiratory fitness, waist:hip ratio, DBP & HDL->	A life skills physical activity intervention in high school girls delivered in PE class increased activity in PE class and decreased TV watching on school days but did not increase total energy expenditure or total physical activity. There were improvements in waist:hip ratio, BP and HDL with no change in BMI,weight or waist circumference but these were at least as common in controls as they were in the intervention groups.	Q10,13. A life skills physical activity intervention in high school girls delivered in PE class increased activity in PE class and decreased TV watching on school days but did not increase total energy expenditure or total physical activity. There were improvements in waist:hip ratio, BP and HDL with no change in BMI,weight or waist circumference but these were at least as common in controls as they were in the intervention groups.	
17146023	Young DR	Effects of a life skills intervention for increasing physical activity in adolescent girls	2006																										
17321427	Haerens L	School-based randomized controlled trial of a physical activity intervention among adolescents	2007	RCT	None	Q10, 13 (RF11)	Belgium	Mult settings	None	9 mo	9 mo	Evaluate the effects of a middle school physical activity intervention, which combines environmental and computer-tailored components, and evaluate the effects of parental involvement	2,840 (15 schools)	Parental/ Family/ Caregiver	7th and 8th grade	Mean age (SD): 13.1 yr (0.8) Boys: 63.4% Higher SES: 32.5%	Arm 1: 1194 (1124) Arm 2: 911 (843)	Behavioral	Arm 1: School-based physical activity intervention + parental support Schools changed physical environment to create more opportunities for physical activity Students received computer-tailored intervention for physical activity during classes and received personal physical activity advice Parents were invited for an interactive meeting and received a CD with the computer-tailored intervention for physical activity to complete at home Arm 2: School-based physical activity intervention alone Schools changed physical environment to create more opportunities for physical activity Students received computer-tailored intervention for physical activity during classes and received personal physical activity advice	735 (714)	Control Arm: No intervention	Mean self-reported total physical activity [min/d (SD)] Mean self-reported school physical activity [min/d (SD)] Mean self-reported leisure time engaging in sports [min/d (SD)] Mean self-reported leisure time engaging in active transportation [min/d (SD)] Mean physical activity of light intensity measured by accelerometer [min/d (SD)] Mean MVPA measured by accelerometer [min/d (SD)] Mean participants meeting physical activity guidelines [% (SD)]	INT+ P: 94.8(53.9) to 97.3(54.5) INT: 100.9(58.7) to 98.7(59.5) CON: 88.3(47.4) to 84.4(46.2) INT+ P: 1.6 (2.16,6) to 22.6(19.0) INT: 16.0(18.4) to 21.5(20.9) CON: 18.5(13.8) to 18.5(14.5) INT+ P: 39.9(43.5) to 38.8(42.2) INT: 43.3(46.3) to 39.7(48.5) CON: 32.6(38.3) to 32.4(35.5) INT+ P: 28.9(15.3) to 26.0(13.4) INT: 43.3(46.3) to 39.7(48.5) CON: 27.1(15.4) to 23.2(13.0) INT+ P: 645.8(61.1) to 624.3(69.9) INT: 664.4(69.2) to 635.2(88.5) CON: 671.0(62.1) to 614.3(70.5) INT+ P: 24.9(16.5) to 28.8(24.8) INT: 27.6(20.5) to 25.7(22.2) CON: 30.6(21.5) to 24.1(20.7) INT+ P: 5% to 12% INT: 6% to 11% CON: 11% to 12%	NS between groups S for INT+ P and INT vs CON. NS between groups NS between groups for boys. For girls, the INT group remained stable but the CON group decreased significantly (p<5%). INT+ P vs CON: S; INT vs CON: p=.05-.08 INT+ P vs CON: S INT+ P vs INT: p=.05-.08 NS between groups	None	The proportion of students meeting recommended activity levels was very low at baseline and post the intervention.	A school-based 9 mos intervention using personalized computer feedback and an exercise enhanced school environment increased physical activity behaviors in middle school boys and girls particularly at school.	Q10, 13 A school-based 9 mos intervention using personalized computer feedback and an exercise enhanced school environment increased physical activity behaviors in middle school boys and girls particularly at school.	
17411468	Verstraete SJ	A comprehensive physical activity promotion programme at elementary school: the effects on physical activity, physical fitness and psychosocial correlates of physical activity	2007	RCT	None	Q10, 13 (RF8, RF11)	Belgium	Community (schools)	None	2 school yr	September 2002 - June 2004	Evaluate the effects of a comprehensive physical activity promotion program in elementary schools on total physical activity levels, physical activity levels in leisure time, physical fitness and psychosocial correlates of physical activity	610 (16 schools)	Pediatric/ Young Adults	4th-5th grade	Mean age (SD): 9.7 yr (0.7) Boys: 399	8 schools (NR)	Behavioral	Arm 1: Comprehensive physical activity promotion program Intervention included a health-related PE program, classroom-based health education lessons, and an extracurricular physical activity promotion program; based on the SPARK program of San Diego State University Main goal of the health-related PE program was to promote high levels of physical activity for all children during PE lessons; also was intended to make teachers aware of the health-promoting role of PE; PE teachers received a manual containing didactical guidelines and sample lessons promoting health-related PE and high activity levels	8 schools (NR)	Control Arm: No intervention Details regarding the Control Arm are not provided	Mean low-intensity physical activity [min/d (SD)] Mean moderate-intensity physical activity [min/d (SD)] Mean vigorous-intensity physical activity [min/d (SD)] Mean MVPA [min/d (SD)] Mean low-to-vigorous physical activity (total PA engagement) [min/d (SD)] Mean leisure-time physical activity index of moderate intensity [min/d (SD)] Mean leisure-time physical activity index of high intensity [min/d (SD)] Mean leisure-time physical activity index of moderate to high intensity [min/d (SD)] Mean sum of skinfolds [mm (SD)] Mean attitude that physical activity is pleasant (SD)	INT: 532.7(61.29) to 547.75(67.55) vs CON: 527.28(57.31) to 537.88(70.98) INT: 129.28(38.40) to 122.90(37.86) vs CON: 137.53(26.89) to 107.45(27.11) INT: 21.48(12.74) to 18.59(12.76) CON: 20.98(11.60) to 17.68(11.28) INT: 150.75(48.17) to 141.50(48.84) CON: 158.51(30.84) to 125.13(33.52) INT: 683.48(64.52) to 689.25(64.83) vs CON:685.79(57.27) to 663.01(72.84) INT:9.70(16.19) to 12.25(18.44) CON:8.99(16.57) to 8.66(15.40) INT:14.10(18.77) to 15.96(20.01) CON:12.31(17.76) to 14.01(19.04) INT:23.80(21.68) to 28.20(24.66) CON:21.30(22.44) to 22.67(21.83) INT: 50.77(25.00) to 55.56(27.79) CON: 52.01(27.30) to 64.04(39.67) No significant difference between groups for any of these variables.	NS between groups S* between groups NS S between groups S between groups S between groups NS S between groups S between groups	None reported	PA levels decline steeply from 9 to 11 years of age.	A school-based comprehensive physical activity program increased PA and prevented a decline in total MVPA engagement and increased leisure time PA. There were no gender differences in the response to the intervention. However, there was no improvement in physical conditioning despite the increased PA levels.	Q10,13. A school-based comprehensive physical activity program increased PA and prevented a decline in total MVPA engagement and increased leisure time PA. There were no gender differences in the response to the intervention. However, there was no improvement in physical conditioning despite the increased PA levels.	
17411468	Verstraete SJ	A comprehensive physical activity promotion programme at elementary school: the effects on physical activity, physical fitness and psychosocial correlates of physical activity	2007																										

PMID	First Author	Title	Year	Study Type	CVD	RF by CQ	Country	Setting	Blinding	Int Length	Total Study Duration	Main Study Objective	Total N	Target Population	Eligibility Criteria	Patient Characteristics	Int. n at Baseline (n at Follow-up)	Int. Type	Specific Intervention	Control n at Baseline (n at Follow-up)	Specific Control	Outcomes Measured	Results/CI	Significance	Safety and Adverse Events	Additional findings	Summary	Main Reported Findings by Critical Question
17554155	Butcher Z	The effect of feedback and information on children's pedometer step counts at school	2007	RCT	None	Q10, 13 (RF8, RF11)	England	Community (schools)	None	1 school wk	December 2004 - April 2006	Examine whether feedback or feedback plus physical activity information could increase the number of pedometer steps taken during 1 school week	177 (3 schools)	Pediatric/ Young Adults	7-11 yr (Grades 3-6)	Males: Arm 1: 17 Arm 2: 25 Control Arm: 18	Arm 1: NR (52) Arm 2: NR (50)	Behavioral	Arm 1: Step count feedback (FB) 15 min recess in morning, 60 min recess during lunchtime, 60 min/wk PE class Students wore unsealed pedometers and recorded total steps/d on personalized record sheets, asked to attempt to increase the number of steps during the following day Arm 2: Step count feedback + information (FB + info) 15 min recess in morning, 60 min recess during lunchtime, 15 min recess in afternoon, 60 min/wk PE class Students wore unsealed pedometers and recorded total steps/d on personalized record sheets, received information and ideas on how they could increase their daily steps Students and teachers were made aware of the different opportunities in the school day for physical activity, and then suggestions were made on how to maximize these opportunities	NR (39)	Control Arm: No step count feedback or information (CON) 15 min recess in morning, 60 min recess during lunchtime, 60 min/wk PE class Students wore sealed pedometers and total steps recorded/d were not revealed to them	Daily pedometer steps/min	FB + info: 17,17(4.87) FB: 13,77(4.06) CON: 12,41(3.12)	FB + info vs FB: S* FB + info vs CON: S** FB vs CON: NS	None reported		In a pedometer-based intervention in elementary school-aged children, provision of feedback + activity information significantly increased pedometer steps over feedback alone.	Q10,13. In a pedometer-based intervention in elementary school-aged children, provision of feedback + activity information significantly increased pedometer steps over feedback alone.
17663296	Eliakim A	The effects of nutritional-physical activity school-based intervention on fitness and fitness in preschool children	2007	RCT	None	Q13 (RF8, RF11)	Israel	Community (schools)	None	4 mo	4 mo	Examine the prevalence of obesity and study prospectively the effects of a brief school-based intervention on anthropometric measures, body composition, leisure time habits and fitness in preschool children	101	Parental/ Family/ Caregiver	Preschool children (5-6 yr) Attending preschool in an upper-middle socioeconomic class community	Mean age (SEM): Arm 1: 66 mo (0.6) Control Arm: 67 mo (0.7) Males: Arm 1: 33 Control Arm: 25	54 (54)	Behavioral	Arm 1: Nutritional intervention + physical activity program Nutritional intervention was designed to improve nutritional education and included such topics as basic knowledge about major food groups and the food pyramid, vitamins, and food preparation and cooking methods; topics were taught through short lectures/talks, games, and book reading; children also received dietary information using worksheets/flyers on nutritional issues Physical activity program consisted of 45 min/d of exercise training 6 d/wk; training was divided into 3 15-min sessions and was based on circuit training Parents were invited to 2 orientation lectures on childhood obesity and beneficial effects of exercise during the first 2 mo of the program	47 (47)	Control Arm: Regular preschool schedule Parents were invited to 2 orientation lectures on childhood obesity and beneficial effects of exercise during the first 2 mo of the program	Mean weight [kg (SEM)] Mean BMI [kg/m <sup>2</sup> (SEM)] Mean BMI percentile (SEM) Mean body fat [% (SEM)] Obese (> 95 <sup>th</sup> percentile) children [%] Overweight (85-95 <sup>th</sup> percentile) children [%] Overall overweight children [n (%)] Mean exercise time [sec (SEM)]	INT: 66(0.6) to 69(0.6) CON: 67(0.7) to 70(0.7) INT:15.7(0.2) to 15.7(0.2) vs CON:15.9(0.2) to 16.2(0.3) INT:53.2(4.0) to 50.3(4.3) to CON:57.1(4.4) to 39.4(4.5) INT:18.1(0.8) to 18.1(0.8) CON: 17.9(0.8) to 18.8(1.0) INT: 7.4% to 5.6% CON: 6.4% to 10.6% INT: 13.0% to 14.8% INT: 17% to 12.8% INT: 20.4% to 20.4% CON: 23.4% to 23.4% INT: 6927(364) CON: 5489(284)	S within and between groups. S for CON; S between groups S within and between groups. S in CON; S between groups NS NS NS S*	None reported	A brief school-based combined nutrition/ physical activity intervention had (+) effects on body wt, BMI percentile, body fat, physical activity and fitness.	Q10,13. A brief school-based combined nutrition/ physical activity intervention had (+) effects on body wt, BMI percentile, body fat, physical activity and fitness.	
17852547	Alhassan S	The effects of increasing outdoor play time on physical activity in Latino preschool children	2007	RCT	None	Q13 (RF11)	USA	Community (schools)	None	December 2005 - February 2006	December 2005 - February 2006	Test the hypothesis that increasing preschool children's outdoor free play time increases their daily physical activity levels	33	Pediatric/ Young Adults	3-5 yr Latino children attending a preschool for low-income families No condition limiting participation in the intervention or assessment of physical activity	Mean age (SD): Arm 1: 3.8 yr (0.5) Control Arm: 3.5 yr (0.5) Boys: 20 Patient characteristics available only for participants who completed the study	18 (17)	Behavioral	Arm 1: Additional recess 60 min of additional recess time on 2 d/wk; additional recess was divided into 2 30-min blocks (1 in morning and 1 in afternoon)	15 (15)	Control Arm: Normal schedule Normal preschool schedule and usual scheduled activities, including normal recess time for 60 min/d divided into 2 30-min blocks	Mean change total day physical activity [counts/min (SD)] Mean change in total day time spent in sedentary physical activity [% (SD)] Mean change in total day time spent in light physical activity [% (SD)] Mean change in total day time spent in MVPA [% (SD)] Mean change during school physical activity [counts/min (SD)] Mean change in during school time spent in sedentary physical activity [% (SD)] Mean change in during school time spent in light physical activity [% (SD)] Mean change in during school time spent in MVPA [% (SD)] Mean change after school/evening physical activity [counts/min (SD)] Mean change in after school/evening time spent in sedentary physical activity [% (SD)]	INT: 58.2(74.6) vs CON: 48.2(114.9) INT: -1.2(1.8) vs CON: -1.0(3.0) INT: 0.8(1.3) vs CON: 0.6(1.8) INT: 0.3(0.8) vs CON: 0.4(1.3) No difference between groups for any of these variables. NS NS NS NS NS NS NS	NS NS NS NS NS NS NS NS	NR	Latino preschoolers were sedentary for on average 90% of their total waking data and during school as classified by accelerometer.	Increasing outdoor play time in a small study of Latino pre-schoolers had no effect on increasing overall physical activity levels.	Q10,13. Increasing outdoor play time in a small study of Latino pre-schoolers had no effect on increasing overall physical activity levels.
17852547	Alhassan S	The effects of increasing outdoor play time on physical activity in Latino preschool children	2007																		Mean change in after school/evening time spent in light physical activity [% (SD)] Mean change in after school/evening time spent in MVPA [% (SD)]	NS NS						