NHLBI Evidence Table: RF11-MA

PMID	First Author	Title	Year	Study Type	CVD	RF by CQ	Study Origin	Setting	Search Range	Data Sources	Study Eligibility Criteria	Number of Studies	Main Study Objective	Study Pop. (N)	Target Population	Patient Characteristics	Study Characteristics	Interv. Type	Specific Intervention Examined	Observational Relationship Assessed	Outcomes Measured	Treatment Effect and Statistical Significance	Main Reported Findings by Critical Question	Limitations of Studies Reviewed	Quality of MA
11023118	Rowlands AV	The effect of type of physical activity measure on the relationship between body fatness and habitual physical activity in children: a meta-analysis	2000	MA	None	Q6 (RF2, RF3, RF8, RF11)	UK	Don't Know/NR	Through Sept 1998	MEDLINE Sport Discus BIOSIS Science Citation Index Reference lists	Subjects < 18 yr Studies with a measure of habitual daily activity Studies with a measure of body fat/relative weight Studies with a effect size *r* or where the effect size could be calculated or estimated Subjects had no disease states other than obesity Studies in which measure of activity did not follow an intervention which might alter habitual daily activity Studies in which measures of fat and activity were taken at the same time Studies in which physical activity was not expressed as energy expended	50	Examine the relationship between activity level and body fat in children and assess whether the type of activity measure used has an effect on the strength of the relationship observed	NR	Pediatric/ Young Adults	Studies only in males: 8 Studies only in females: 4 Studies in males and females: 38	Median number of subjects: 86	N/A	N/A	Body fatness and habitual physical activity	Mean effect size	78% of studies reported a negative relationship between activity levels and body fat; 18% were non-significant; 4% showed a positive relationship The mean effect size was -0.16. This decreased to -0.10 when studies were weighted for degrees of freedom. Omitting the 9 non-significant studies increased the mean effect size to -0.19 and the weighted mean effect size to -0.11; the Stouffer Z associated with the mean effect size was statistically significant at 11.72 ($p < 0.001$). The 95% CI (-0.12 to -0.20) indicated that the relationship between activity levels and body fat was small to moderate Effect sizes were significantly heterogeneous ($p < 0.001$), which indicate that additional variables were moderating the relationship (e.g., activity measure used) Correlational analyses revealed no effect of gender, age group, or use of extreme/continuous fat groups on the strength of the relationship between activity levels and body fat The use of extreme activity groups elicited higher effect sizes than continuous activity groups (*r*: 0.285, $p < 0.05$)	Q6: Correlational analyses revealed no effect of gender, age group, or use of extreme/continuous fat groups on the strength of the relationship between activity levels and body fat Evidence indicated that there is a weak to moderate relationship between body fat and activity in children; however, activity only explains a small proportion of the variance in fatness	Possibility of publication bias Possibility of observation bias when reporting physical activity Wide variety of indicators of fatness; insufficient studies using techniques other than skinfolds to investigate the measure of fat as a potential moderator variable	
15314635	Marshall SJ	Relationships between media use, body fatness and physical activity in children and youth: a meta-analysis	2004	MA	None	Q6 (RF2, RF3, RF8, RF11)	USA	Don't Know/NR	Computerized search for media use and body fatness review: 1985 onward Computerized search for media use and physical activity review: No cut-off date Manual search: 1980-2002	MEDLINE PsychInfo SportDiscus Ingenta Reference lists Manual search of reprint files held by the Sedentary Behavior Research Group at Loughborough University	Papers or abstracts in peer-reviewed journals published in English Participants < 18 yr Included at least 1 empirical association between TV viewing, video/computer game use and body fatness or physical activity Exclusions: Media use and body fatness review: Involved experimental manipulations of sedentary behavior and physical activity; involved interventions targeting additional sedentary behaviors; were single-subject case studies; measured only body mass; or presented data already published	Media use and body fatness review: 30 studies (52 independent samples) Media use and physical activity review: 24 studies (41 independent samples)	Examine evidence of a relationship between TV viewing, video/computer game use and body fatness among children and youth and assess whether these prevalent sedentary behaviors displace physical activity	Media use and body fatness review: 44,707 Media use and physical activity review: 143,235	Pediatric/ Young Adults	Media use and body fatness review: < 7 yr: 8% of samples 7-12 yr: 46% of samples 13-18 yr: 23% of samples Combination age range: 23% of samples Girl-only: 42% of samples Boy-only: 29% of samples Boys and girls: 29% of samples	C/S samples: 43 Longitudinal samples: 8 RCT samples: 1 Media use and body fatness review: Sample size range: 22-7,299 (median: 294) Media use and physical activity review: Sample size range: 36-20,766 (median: 527)	N/A	N/A	TV viewing and body fatness Video/computer game use and body fatness TV viewing and physical activity Video/computer game use and physical activity	Mean sample-weighted corrected effect size (Pearson *r*)	Based on data from 52 independent samples, the mean sample-weighted effect size between TV viewing and body fatness was 0.066 (95% CI: 0.056 to 0.078); the sample-weighted fully corrected effect size was 0.084. While this relationship was statistically significant ($p < 0.05$), the fact that 99% of the variance in body fatness may be explained by factors other than TV viewing calls into question the clinical relevance of the TV viewing and body fatness relationship Although few studies have examined the relationship between TV viewing and fatness in very young children (0-6 yr), evidence suggests that effects are greater in this age group than during adolescence (13-18 yr). The mean effect size appears invariant with regard to gender Based on data from 6 independent samples, the mean sample-weighted effect size between video/computer game use and body fatness was 0.070 (95% CI: -0.048 to 0.188); the sample-weighted fully corrected effect size was 0.128. The 95% CI for the sample-weighted effect size suggests that there is no relationship between the variables	Q6: Although few studies have examined relationships between TV viewing and fatness in very young children (0-6 yr), evidence suggests that effects are greater in this age group than during adolescence (13-18 yr). The mean effect size appears invariant with regard to gender The relationship between TV/video games and physical activity is 0 among ages 0-6 yr and small among ages 7-18 yr. There was no significant difference in the size of effect among ages 7-12 and 13-18 yr. The mean effect size appeared invariant with regard to gender A statistically significant relationship exists between TV viewing and body fatness among children and youth, although it is likely to be too small to be of substantial clinical relevance The relationship between TV viewing and physical activity is small but negative	Second-order sampling error may be present Possible relationships may be confounded by factors such as the consumption of energy-dense snacks that may accompany TV viewing and video/computer game use Overwhelming reliance on C/S studies with detached and statistically aggregated time-use patterns across a d or wk severely restricts the conclusions that can be drawn	
15314635	Marshall SJ	Relationships between media use, body fatness and physical activity in children and youth: a meta-analysis	2004								Media use and physical activity review: Presented insufficient data for meta-analytic synthesis; presented data on composite measures of sedentary behavior; or reported on special populations					Media use and physical activity review: < 7 yr: 7% of samples 7-12 yr: 22% of samples 13-18 yr: 39% of samples Combination age range: 32% of samples Girl-only: 41% of samples Boy-only: 32% of samples Boys and girls: 27% of samples					Based on data from 39 independent samples, the mean sample-weighted effect size between TV viewing and physical activity was -0.096 (95% CI: -0.080 to -0.112); the sample-weighted fully corrected effect size was -0.129. Effect size varied by intensity of physical activity, with only vigorous activity being significantly and inversely associated with TV viewing Based on data from 10 independent samples, the mean sample-weighted effect size between video/computer game use and physical activity was -0.104 (95% CI: -0.080 to -0.128); the sample-weighted fully corrected effect size was -0.141 The relationship between TV/video games and physical activity is 0 among ages 0-6 yr and small among ages 7-18 yr. There was no significant difference in the size of effect among ages 7-12 and 13-18 yr. The mean effect size appeared invariant by gender			
16246411	Marshall SJ	A descriptive epidemiology of screen-based media use in youth: a review and critique	2006	MA	None	Q6 (RF2, RF11) Q8 (RF2, RF11)	USA	Don't Know/NR	NR	MEDLINE (PubMed) OCLC FirstSearch UnCover Article bibliographies Hand searches	Majority of participants in study < 18 yr Published in English Exclusions: Aggregate measures of sedentary behavior (TV viewing combined with video game playing and computer use) Studies in which "inactivity" was used as a measure of sedentariness Studies with insufficient or ambiguous data Studies with multiple publications of the same data	90	Estimate the prevalence and 'dose' of TV viewing, video game playing and computer use, and assess age-related and secular trends in TV viewing among youth (≤ 18)	NR	Pediatric/ Young Adults	Age range: 2-18 yr	Sample size range: 19-37,000	N/A	N/A	Effect of age and gender on TV, video game and computer use	TV viewing Video game playing Computer use	Boys were significantly more likely to be "high users" of TV than girls (30% vs. 25%, $p < 0.05$); no significant difference between genders for likelihood of being "low users" Boy were significantly more likely than girls to play video games for more than 4 hr/wk (30% vs. 7%, $p < 0.05$) Age-related differences were not statistically significant Longitudinal studies suggest boys' and girls' TV viewing increased between the ages 6–11 yr, and decreased between the ages 11–15 yr. It was estimated that about 80% of the changes between 11 and 15 yr were due to age Those categorized as high TV viewers at young ages were likely to remain in the high TV viewing category at older ages There was evidence for a gender effect for dose of video game playing ($p < 0.05$), with boys playing longer than girls. There was no evidence for a gender effect for computer use ($p > 0.05$)	Q6: Boys were significantly more likely to be "high users" of TV than girls (30% vs. 25%, $p < 0.05$); no significant difference between genders for likelihood of being "low users" Boy were significantly more likely than girls to play video games for more than 4 hr/wk (30% vs. 7%, $p < 0.05$) There was evidence for a gender effect for dose of video game playing ($p < 0.05$), with boys playing longer than girls. There was no evidence for a gender effect for computer use ($p > 0.05$) Q8: Longitudinal studies suggest boys' and girls' TV viewing increased between the ages 6–11 yr, and decreased between the ages 11–15 yr. It was estimated that about 80% of the changes between 11 and 15 yr were due to age Those categorized as high TV viewers at young ages were likely to remain in the high TV viewing category at older ages	Publication bias Majority of primary studies did not address validity/reliability of data/measures Recall periods varied Cross-sectional study comparisons Limited standardization of measures Inter-sample behavioral variations	
17387251	Tomkinson GR	Secular changes in pediatric aerobic fitness test performance: the global picture	2007	MA	None	Q5 (RF11) Q6 (RF2, RF3, RF11)	Australia	Don't Know/NR	NR	Computer search of online bibliographic databases (unspecified) and the University of South Australia's library catalog Manual search of all hard copy scientific journals, books, and bibliographic indexes held at the University of South Australia Library Examining and cross-referencing the reference lists of all located studies Personal communication with the authors of each located study	Studies that explicitly reported on secular changes in aerobic fitness test performance of normal children and adolescents, or studies that have published data from which secular changes can be estimated Exclusions: Large, undifferentiated age ranges spanning 3 or more yr Sample not distinguished by sex Samples previously reported in other located studies Samples not spanning at least 2 time point across a minimum of 3 yr Individuals not tested on maximal field running tests of aerobic performance (e.g., timed runs, distance runs, and endurance shuttle runs)	33	Quantify the global change in pediatric aerobic fitness test performance	25455527	Pediatric/ Young Adults	6-19 yr From 27 countries and 5 geographical regions	Majority of the retained studies were peer-reviewed scientific journal articles or books (58%), with the remainder being published book chapters (12%), published conference articles (9%), postgraduate theses (6%), or commissioned reports (15%) Studies analyzed secular changes in randomized-stratified samples, stratified-uniform samples, stratified-proportional samples, and convenience samples, collected at the country (59%), state/province (18%), or city (23%) level	None	N/A	Pediatric aerobic fitness test performance over time	Mean change in aerobic performance [% (95% CI)]	Aerobic performances have declined precipitously over the past 3 decades; aerobic performances have declined globally at a rate of -0.46% since 1970; these changes are in stark contrast to those reported for children's anaerobic fitness test performance Across the decades, mean changes for boys and girls, and for children (<13 yr) and adolescents (≥13 yr) were remarkably similar All groups showed improvements in the 1960s and declines of increasing magnitude every decade thereafter Mean changes were similar among geographical regions; over the period 1970-2000, mean declines ranged from -0.74% for North America to -0.31% for Europe Mean changes for high versus middle and low income economies were also strikingly similar between 1970 and 2000; the rate of decline for high income economies was -0.49%, marginally higher than the decline of -0.39 for middle and low income economies	Q5: Mean changes were similar among geographical regions and among high versus middle and low income economies Q6: Across the decades, mean changes in aerobic performance for boys and girls, and for children (<13 yr) and adolescents (≥13 yr) were remarkably similar	Studies examined secular changes across groups which were sampled using different protocols (from convenience samples to randomized national surveys), and conceivably tested using different protocols (e.g., different running surfaces, practice runs)	Fair - many included studies were from non-standard settings.
17387254	Tomkinson GR	Who are the Eurofittest?	2007	MA	None	Q5 (RF11) Q6 (RF2, RF8, RF11)	Europe	Don't Know/NR	No date restrictions were applied	Australian Sport CINAHL Current Contents Digital Dissertations ERIC MEDLINE Sports Discus	Any study which used the Eurofit or provisional Eurofit test batteries to assess the fitness of healthy European children and adolescents Exclusions: Studies reporting data on elite young sportspeople or groups with specific disabilities or disease conditions (e.g., obesity) Individuals not aged 7-18 yr Large, undifferentiated age ranges Sample not distinguished by sex Sample previously reported in other located studies	67	Describe the variability in fitness test performance among children and adolescents from different parts of Europe	NR	Pediatric/ Young Adults	NR	60% of included studies were peer-reviewed scientific journal articles or books, 3% were published book chapters, 16% were published conference papers or abstracts, 9% were post-graduate theses, 9% were commissioned reports, and 3% were unpublished datasets Most studies used convenience samples (51%) with 42% using randomized-stratified samples and 7% using stratified-proportional samples	None	N/A	Fitness test performance according to European country/region of residence Fitness test performance according to per capita Gross Domestic Product Fitness test performance according to Gini Index (distribution of wealth) Fitness test performance according to Olympic performance Fitness test performance according to min/wk devoted to school PE Fitness test performance according to latitude Fitness test performance according to mean annual temperature Fitness test performance according to BMI z-scores Fitness test performance according to gender	Sample-weighted mean flamingo balance [z-score (SE)] Sample-weighted mean plate tapping [z-score (SE)] Sample-weighted mean sit-and-reach [z-score (SE)] Sample-weighted mean standing broad jump [z-score (SE)] Sample-weighted mean hand-grip [z-score (SE)] Sample-weighted mean sit-ups [z-score (SE)] Sample-weighted mean bent arm hang [z-score (SE)] Sample-weighted mean agility shuttle run [z-score (SE)] Sample-weighted mean endurance shuttle run [z-score (SE)]	On average, Wales was the best performing country on the flamingo balance test; the Netherlands on the plate tapping and agility shuttle run; Switzerland on the sit-and-reach and sit-ups; Iceland on the standing broad jump; Slovakia on the hand-grip and bent arm hang; and Estonia on the endurance shuttle run There was considerable variability in the mean z-scores among countries, ranging from a minimum of 0.70 SDs for flamingo balance to a maximum of 1.9 SDs for hand-grip Finland, Slovakia, and Iceland were the best performing countries overall; countries of northern and central Europe consistently outperformed those of western and southern Europe Gross Domestic Product was not significantly related to the overall mean z-score nor to the z-score for any specific test The Gini Index was not significantly related to the overall z-score Olympic performance was moderately and significantly related to overall mean z-score with the most successful Olympic country (Finland) also having the best Eurofit performance Min/wk devoted to school PE was unrelated to fitness performance Both latitude and mean annual temperature were related to overall mean z-score BMI z-scores were not related to overall mean z-scores, but were significantly related to performance on the endurance shuttle run	Q5: Finland, Slovakia, and Iceland were the best performing countries overall; countries of northern and central Europe consistently outperformed those of western and southern Europe; Gross Domestic Product was not significantly related to the overall mean z-score nor to the z-score for any specific test; the Gini Index was not significantly related to the overall z-score; latitude was related to overall mean z-score Q6: BMI z-scores were not related to overall mean z-scores, but were significantly related to performance on the endurance shuttle run; there was a great deal of consistency between boys' and girls' relative performances within a country	Despite using Eurofit test protocols, tests may not have always been conducted under precisely the same conditions (e.g., weather, test surfaces, practice); such factors were seldom reported and were therefore uncontrollable Differences in sampling protocols, ranging from convenience samples to randomized national surveys Despite using Eurofit test protocols, tests may not have always been conducted under precisely the same conditions (e.g., weather, test surfaces, practice); such factors were seldom reported and were therefore uncontrollable Differences in sampling protocols, ranging from convenience samples to randomized national surveys	Fair - many included studies were from non-standard settings.