Supplementary file 4. Study characteristics.

Study	Year	Country	N	Age (yrs) $(\bar{X} \pm SD)$ or Range	Sex	Overweight/Obesity Criteria
Ackel-D'Elia et al.[13]*	2014	Brazil	AE = 24 AE+ST = 24	AE, AE+ST = 16.5 ±1.5	MF	All classified as obese (BMI ≥ 95th percentile) based on 2000 CDC BMI charts
Alberga et al.[14]	2013	Canada	AE+ST = 12 CON = 7	AE+ST = 10.0 ± 1.0 CON = 10.0 ± 2.0	MF	All classified as obese (BMI ≥ 95th percentile) based on 2000 CDC BMI charts
Alves et al.[15]	2008	Brazil	AE = 39 CON = 39	AE = 8.0 ± 1.8 CON = 7.9 ± 1.5	MF	BMI ≥ 85 percentile
Andre & Beguier[16]	2015	France	AE = 8 CON = 8	AE, CON 14.4 ± 1.5	MF	NA ($\bar{X}$ BMI = 37.7 kg·m²)
Ben Ounis et al.[17]	2010	Tunisia	AE = 16 CON = 16	AE = 13.4 ± 0.4 CON = 13.2 ± 0.6	MF	All classified as obese (BMI ≥ 97th percentile)

Berntsen et al.[18]	2010	Norway	ST = 32	ST, CON = 12.1	MF	All classified as obese (BMI >97.5 percentile)
			CON = 16			
Cao et al.[19]	2012	China	AE = 20	AE = NA	M	All classified as obese (BMI $\geq$ 25 kg·m²)
			CON = 20	CON = NA		
Chang et al.[20]	2008	China	AE+ST = 25	AE+ST = 12.6 $\pm$ 0.8	MF	All classified as obese (BMIs $\geq$ 95th percentile for sex-specific age group Chinese children aged 7–18 years)
			CON = 24	CON = 12.2 $\pm$ 0.1		
Chen et al.[21]	2015	China	AE =15	AE = 14.1 $\pm$ 3.1	NA	All classified as obese (BMI $\geq$ 25 kg·m²)
			ST = 15	ST = 13.9 $\pm$ 2.2		
			AE+ST = 15	AE+ST = 14.2 $\pm$ 3.8		
			CON = 15	CON = 14.4 $\pm$ 3.2		
Chen et al.[22]	2016	Taiwan	AE = 25	AE = 12.6 $\pm$ 0.7	MF	All classified as obese (BMI >24 kg·m²), equivalent to the 95th percentile for Taiwan growth charts
			CON = 25	CON = 12.8 $\pm$ 0.8		

Cheng et al.[23]	2012	China	AE+ST = 30 CON = 30	AE+ST, CON = 13.0 to 14.0	M	All classified as obese (BMI $\geq$ 25 kg·m²)
Davis et al.[24]	2012	US	AE (LD) = 71 AE (HD) = 73 CON = 78	AE (LD) = 9.3 $\pm$ 0.9 AE (HD) = 9.4 $\pm$ 1.2 CON = 9.4 $\pm$ 1.1	MF	BMI $\geq$ 85th percentile based on 2000 CDC growth charts
Elloumi et al.[25]	2011	Tunisia	AE = 7 CON = 8	AE = 13.1 $\pm$ 1.0 CON = 13.2 $\pm$ 0.2	M	All classified as obese (> 97th percentile)
Farpour-Lambert et al.[26]	2009	Switzerland	AE+ST = 22 CON = 22	AE+ST = 9.1 $\pm$ 1.4 CON = 8.8 $\pm$ 1.6	MF	All classified as obese (BMI > 97th percentile based on age and sex)
Fazelifar et al.[27]	2013	Iran	AE+ST = 12	AE+ST, CON = 11-13	M	All classified as obese (BMI > 28 kg·m²)

Study	Year	Country	N	Age	Sex	Classification
Fiorilli et al.[28]	2017	Italy	CON = 12 AE = 12 ST(MI) = 15 ST(HI) = 14	AE, ST(MI), ST(HI) = 12-15	MF	Overweight or obese (BMI >85th percentile and body fat $\geq$ 25% for boys and $\geq$ 30% for girls)
Ghorbanian et al.[29]	2013	Iran	AE = 15 CON = 15	AE = 17.4 $\pm$ 1.1 CON = 16.9 $\pm$ 1.2	M	NA, but all classified overweight or obese by authors (BMI ($\bar{X} \pm SD$) was 28.41 $\pm$ 2.36 $kg \cdot m^{-2}$)
Gutin et al.[30]	1997	US	AE = 17 CON = 18	AE = 9.6 $\pm$ 0.8 CON = 9.5 $\pm$ 1.3	MF	NA, but all classified as obese by authors ($\bar{X}$ BMI was 31.4 $kg \cdot m^2$ in exercise group and 28.8 $kg \cdot m^2$ in control group)
Hagstromer et al.[31]	2009	Sweden	AE+ST = 16 CON = 15	AE+ST = 13.7 $\pm$ 2.0 CON = 13.6 $\pm$ 2.2	MF	All classified as obese according to International of Obesity Task Force cutpoints
Hay et al.[32]	2016	Canada	AE(MI) = 32	AE(MI) = 15.1 $\pm$ 1.8	MF	Overweight or obese based on age- and sex-specific BMI standards

				AE(HI) =	AE(HI) = 15.3 ±		
				38	1.7		
				CON =	CON = 15.2 ±		
				33	1.7		
Karacabey[33]	2009	Turkey	AE = 20	AE = 11.8 ± 0.5	M	All classified as obese (BMI ≥ 30.0 kg·m²)	
			CON =	CON = 11.2 ±			
			20	0.2			
Kelly et al.[34]	2004	US	AE = 10	AE = 11.0 ± 2.0	MF	Overweight or obese (BMI ≥ 85th percentile)	
			CON =	CON = 11.0 ±			
			10	2.3			
Kelly et al.[35]	2015	US	ST = 13	ST = 15.2 ± 0.9	MF	All classified as obese (BMI ≥ 95th percentile) based on 2000 CDC BMI charts	
			CON =	CON = 15.5 ±			
			13	0.9			
Kim et al. [36]	2007	SK	AE = 14	AE = 17 ± 0.4	M	NA, but classified as obese ($\bar{X} \pm SD$ BMI in group was, 29.5 ± 2.2 kg·m²)	
			CON =	CON = 17.0 ±			
			12	0.4			
Kim et al. [37]	2008	SK	AE+ST =	AE+ST, CON =	M	Overweight or obese (BMI ≥ 85th percentile based 1999 growth charts for Korean children and adolescents aged 2–18 years)	
			8	NA			
			CON = 9				

Lau et al.[110]	2015	China	AE(LI) = 21	AE(LI) = 9.9 $\pm$ 0.9	MF	Overweight according to age-specific BMI cut-off values (boys >20.20 kg·m^2 and girls >20.29 kg·m^2)
			AE(HI) = 15	AE(HI) = 11.0 $\pm$ 0.6		
			CON = 12	CON = 10.6 $\pm$ 0.6		
Lee et al.[39]	2012	US	AE = 16	AE =15.2 $\pm$ 0.9	M	All classified as obese (BMI $\geq$ 95th percentile) based on 2000 CDC BMI charts
			ST = 16	ST = 14.6 $\pm$ 1.5		
			CON = 13	CON = 14.8 $\pm$ 1.4		
Lee et al.[40]	2013	US	AE = 16	AE = 14.6 $\pm$ 1.9	F	All classified as obese (BMI $\geq$ 95th percentile) based on 2000 CDC BMI charts
			ST = 16	ST = 14.8 $\pm$ 1.9		
			CON = 12	CON = 15.0 $\pm$ 2.2		
Li et al.[111]	2014	China	AE = 20	AE = 15.4 $\pm$ 2.6	M	All classified as obese (BMI $\geq$ 25 kg·m^2)
			CON = 20	CON = 14.6 $\pm$ 3.5		
Maddison et al.[42]	2011	NZ	AE = 160	AE, CON = 11.6 $\pm$ 1.1	MF	Overweight or obese according to International Obesity Task Force international cutoffs for child obesity
			CON = 162			

McNarry et al.[43]	2015	UK	AE = 15	AE, CON = 9.3	MF	Obese, defined as BMI $\geq$ 95th percentile
			CON =	$\pm$ 0.9		
			11			
Meyer et al.[44]	2006	Germany	AE = 33	AE = 13.7 $\pm$ 2.1	MF	Obese, defined as > 95th percentile for German pediatric population
			CON =	CON = 14.1 $\pm$		
			34	2.4		
Monteiro et al.[45]	2015	Brazil	AE = 11	AE = 11.0 $\pm$ 1.0	MF	Obese according to BMI
			AE+ST =	AE+ST = 11.0 $\pm$		
			14	1.3		
Murphy et al.[46]	2009	US	AE = 23	AE = 10.3 $\pm$ 1.9	MF	Overweight (BMI $\geq$ 85th percentile)
			CON =12	CON = 10.0 $\pm$		
				1.3		
Nobre et al.[47]	2017	Brazil	AE = 40	AE = 9.8 $\pm$ 5.7	M	Overweight (BMI = 85th to 95th percentile) and obese BMI $\geq$ 95th
			CON =	CON = 9.9 $\pm$ 4.8		percentile)
			19			
Owens et al.[48]	1999	US	AE = 35	AE = 9.5 $\pm$ 1.2	MF	Obese, classified as a triceps skinfold greater than the 85th
			CON =	CON = 9.4 $\pm$ 1.3		percentile for gender, age, and ethnicity
			39			
Park et al.[49]	2012	SK	AE+ST =	AE+ST = 12.1 $\pm$	MF	BMI $\geq$ 85th percentile for age and gender according to WHO cut-off
			15	0.4		points

			CON = 14	CON = 12.2 ± 0.4		
Racil et al.[50]	2013	Tunisia	AE(MI) = 11	AE(MI) = 16.3 ± 0.5	F	BMI >97th percentile according to French standards
			AE(HI) = 11	AE(HI) = 15.6 ± 0.7		
			CON = 12	CON = 15.9 ± 1.2		
Racil et al.[51]	2016	Tunisia	AE = 23	AE = 16.6 ± 0.9	F	Obese according to CDC growth charts
			AE+ST = 26	AE+ST = 16.5 ± 1.2		
			CON = 19	CON = 16.9 ± 1.0		
Rooney et al.[52]	2005	US	AE = 26	AE = 8.9 ± 2.2	MF	Overweight or obese (BMI ≥ 84.5 percentile)
			CON = 33	CON = 8.6 ± 2.1		
Saygin & Ozturk [53]	2011	Turkey	AE = 20 CON = 19	AE, CON = 10.0 to 12.0	F	NA, but authors classified all participants as obese (baseline BMI $\bar{X} \pm SD$ = 25.9 ± 2.1 in exercise group and 26.1 ± 1.4 in control group)

Schranz et al.[54]	2014	Australia	ST = 26	ST = 14.9 $\pm$ 1.4	M	Overweight or obese according to Cole et al. BMI cutpoints
			CON = 23	CON = 15.1 $\pm$ 1.6		
Seo et al.[55]	2012	SK	AE = 10	AE = 14.7 $\pm$ 1.5	M	Obese, defined as BMI >95th percentile based on French population standards
			CON = 10	CON = 14.6 $\pm$ 3.0		
Shaibi et al.[56]	2006	US	ST = 11	ST = 15.1 $\pm$ 1.7	M	Overweight or obese (BMI $\geq$ 85th percentile based on 2000 CDC growth charts)
			CON = 11	CON = 15.6 $\pm$ 1.7		
Sigal et al.[57]	2014	Canada	AE = 75	AE = 15.5 $\pm$ 1.4	MF	Obese (BMI $\geq$ 95th percentile for age and sex)
			ST = 78	ST = 15.9 $\pm$ 1.5		
			AE+ST = 75	AE+ST = 15.5 $\pm$ 1.3		
			CON = 76	CON = 15.6 $\pm$ 1.3		
Silva et al.[58]	2012	Brazil	AE = 9	AE, CON = 13 to 17 yrs	MF	Overweight or obese according to Cole et al. BMI cutpoints
			CON = 5			
Song et al.[59]	2012	SK	AE = 12	AE = 12.7 $\pm$ 0.7	M	Obese (> 30% body fat)
			CON = 10	CON = 12.6 $\pm$ 0.6		

Staiano et al.[60]	2017	US	AE = 20 CON = 18	AE = 15.3 ± 1.2 CON = 16.1 ± 1.4	F	Overweight or obese (BMI ≥ 85th percentile)
Sun et al.[61]	2011	China	AE = 25 CON = 17	AE, CON 13.6 ± 0.7	MF	Overweight or obese (>85th percentile) based on China Obesity Task Force Recommendations
Tan et al.[62]	2010	China	AE = 30 CON = 30	AE = 9.4 ± 0.5 CON = 9.5 ± 0.5	MF	Obese (body mass greater than 20% of standard body-mass-for height of Chinese children)
Vasconcellos et al.[63]	2016	Brazil	AE = 10 CON = 10	AE = 14.1 ± 1.3 CON = 14.8 ± 1.5	MF	Obese (BMI >2 standard deviations above age and sex specific WHO reference medians)
Watts et al.[64]	2004	Australia	AE+ST = 19 CON = 19	AE+ST, CON = 14.3 ± 1.5	MF	Obese according to Cole et al. BMI cutpoints
Watts et al.[65]	2004	Australia	AE = 14 CON = 14	AE, CON = 8.9 ± 1.6	MF	Obese according to Cole et al. BMI cutpoints

Study	Year	Country	N	Age ($\bar{X} \pm SD$)	Sex	Criteria
Weintraub et al.[66]	2008	US	AE = 9 CON = 12	AE = 9.5 $\pm$ 0.6 CON = 10.3 $\pm$ 0.8	MF	Overweight or obese (BMI $\geq$ 85th percentile based on 2000 CDC BMI growth charts)
Wong et al.[67]	2008	Singapore	AE+ST = 12 CON = 12	AE+ST = 13.8 $\pm$ 1.1 CON = 14.3 $\pm$ 1.5	M	Obese according to Cole et al. BMI cutpoints
Youssef et al.[68]	2015	Lebanon	AE = 14 CON = 9	AE = 16.1 $\pm$ 1.1 CON = 16.3 $\pm$ 1.5	F	Overweight or obese according to Cole's BMI cutpoints
Zehsaz et al.[69]	2017	Iran	AE = 16 CON = 16	AE = 10.8 $\pm$ 0.9 CON = 10.3 $\pm$ 0.9	M	Overweight or obese (BMI $\geq$ 25 kg·m^2)

Notes: US, United States; SK, South Korea; NZ, New Zealand; UK, United Kingdom; N, number of participants; yrs, years; AE, aerobic exercise, LPA, leisure physical activity; ST, strength training; CON, control; $\bar{X} \pm SD$, mean $\pm$ standard deviation; LI, lower intensity; MI, moderate-intensity; HI, high-intensity; M, males; F, females; NA, not available; LD, low-dose; HD, high-dose; BMI, body mass index; CDC, Centers for Disease Control and Prevention; WHO, World Health Organization *, study also included a leisure intervention but was excluded because it didn't meet our eligibility criteria.