

Supplemental table 2. Description of the included studies and their results

Authors., year	Population	Outcome	Methods	Methods' reliability	Results	Intervention	Comments
De Toia et al., 2009 (Germany)	1228 4.7±1 yo boys and girls 3.5% OB / 9.6% OW / 83.3% NW BMI > 97th percentile (national values Kromeyer-Hauschild et al., 2001; Reinehr et al., 2003)	Lower limbs muscle capacities	Standing Long Jump (cm)	Field test widely used. Good reliability	The ANOVA missed to reveal any differences between groups: OB: 68.2 ± 23.7 cm OW: 67.6 ± 22.5 cm NW: 69.7 ± 25.7 cm An underweight group was also consider when analyzing the data with 70.5 ± 21.6 cm		
Aucouturier et al., 2007 (France)	70 6-8 yo OB boys and girls 70 Age -matched NW Obesity according to Cole et al., 2000 (IOTF)	Lower limbs muscle capacities	Two short all-out sprint against different braking loads: 25 and 50 g/kg body mass with 3 minutes of rest in-between.	Good reliability	Absolute CPP (in W) higher in OB CPP related to BM: lower in OB CPP.FFM: no diff Fopt higher in OB Fopt.BM: lower in OB Fopt.FFM: higher in OB girls vs. OB boys; no diff between OB girls and NW girls; NW boys and NW girls or NW boys and OB boys.		
Thivel et al., 2011 (France)	101 OB 6-10 yo 356 NW 6-10 yo BMI >97th French curves (Roland-Cachera et al., 1991)	Lower limbs muscle capacities	Friction load ergometer / Two short all-out sprints against different braking loads: 25 and 50 g/kg body mass with 3 minutes of rest in-between. The best performance was used as reference CPP	Good reliability	Absolute CPP (in W) higher in OB CPP related to Body mass: lower in OB CPP.FFM: higher in OB Fopt higher in OB CPP (W; W/kg; W/FFM) improved by intervention	6 months of PA (2/week + PE).	
Shang et al., 2010 (China)	541 OB 6-11 yo 228 UW and 1036 OW and 5024 NW WHO references for obesity	Lower limbs muscle capacities	standing broad jump	Field test with relatively good reliability	OB standing broad jump (cm) boys: 132.0 ± 21.1 girls: 128.8 ± 21.4 UW: boys=152.6 ± 23.5; girls=140±19.4 NW: boys= 149.0±22.2; girls=138.1±21.5		

OW: boys= 140.6 ±22.1; girls= 132.2 ± 21.2

No significant weight status difference

Pongprapai et al., 1994	123 OB 6-12 yo boys and girls 111 NW 6-12 yo boys and girls 25 OW 6-12 yo boys and girls	Lower limbs muscle capacities	Sit-up. Test modified from the Standard Physical Fitness Test of the Sport Science Centre, Sport Authority of Thailand, 1984.	Filed test with relatively good validity	Data as boys vs. girls OB: Sit up (time/30s): 7±7 vs. 5±5* OW: Sit up (time/30s): 10±6 vs. 7±6* NW: Sit up (time/30s): 15±6 vs. 8±6*
(Souther Thailand)	Reference values of Bangkok children (Wichaidet, 1990)				Weight status effect in boys and girls *
Ervin et al., 2014	1224 6-15 yo Boys and girls 760 NW 214 OW 250 OB	Abdominal and upper and Lower limbs muscle capacities	NNYFS battery: Plank Modified pull-up Knee extension test handgrip	Filed test with relatively good validity	Plank Positive relationship between age and length of sustained plank position Length of sustained plank decreased with weight status Pull-Up Older boys performed better than younger ones but no diff in girls. Number of pull-ups decrease with increased weight status. Knee extension Positive relationship between age and knee extension performance Increased knee extension perf with increasing weight status. Grip test Positive relationship between age and grip performance Increased grip perf with increasing weight status.
(USA)	Obesity according to CDC				
Castro-Pinero et al., 2009	2778 6-17 yo 6% UW 63% NW 24%OW 7% OB (n: 187)	Upper and Lower limbs muscle capacities	Standing broad jump Vertical jump Throw basketball Push ups (max repetition) Bent Harm Hang (as long as possible) Pull ups Sit ups	Field tests with good reliability	Except for the Throw ball test where no difference appear, the obese youth have lower performances (results presented in absolute) compare to the other weight status groups.
(Spain)	Obesity according to Cole et al., 2000 (IOTF)				

			Curl ups of 30 seconds Curl ups				
Ceschia et al., 2015 (Italy)	2411 7-11 yo (UW-NW-OW-OB) Obesity according to Cole et al., 2000 (IOTF)	Upper and Lower limbs muscle capacities	Handgrip Backward medicine ball throw Long jump test	Field test widely used. Good reliability	7 /8/9 yo: Long jump (m): OB<UW-NW-OW* Lower limb power (W/kg): OB<UW-NW-OW* Handgrip (N): no difference 10/11 yo: Long jump (m): no difference Lower limb power (W/kg): no difference Handgrip (N): no difference		
McGuigan et al., 2009 (Australia)	48 7-12 yo(OB+OW) BMI percentile according to Freedman et al., 2005 (95th percentile)	Lower limbs muscle capacities	Lower limb strength : 1RM squat exercise (squat machine) Lower limb power: SJ and CMJ (power plate)	Field test widely used. Good reliability	Data are presented as pre to post intervention 1RM squat (kg): 22.3 ± 8.7 to 38.8 ± 16.1* CMJ peak power (W.kg-1): 18.6 ± 6.4 to 20.0 ± 7.9 CMJ height (cm): 19.5 ± 6.2 to 22.1 ± 5.3* SJ peak power (w.kg-1): 16.7 ± 10.9 to 17.3 ± 8.1 SJ height (cm): 23.1 ± 7.9 to 26.7 ± 7.3*	8-week resistance training program of 3 sessions per week.	
Sgro et al., 2009 (Australia)	31 OW+OB 7-12 yo WHO references for obesity	Lower limbs muscle capacities	Static Jump test using a ballistic measurement plate.	Good reliability	SJ power was only significantly increased after 24 weeks of intervention compared with 8 and 16 weeks. Exact results are not detailed.	The aim was to compare resistance training interventions durations: 8 vs. 16 vs. 24 weeks	
Andreas et al., 2010 (Brazil)	n=988, 7-15 yo 16.9% OB/ 63.8% NW / 15.9%OW/ 3.4% UW BMI > 95th percentile (WHO, 1995)	Abdominal capacities	1-minute abdominal test	Field indirect test with low reliability compared to a lab test This reflect more the endurance than strength itself	OB boys: 26.1±8.3 repetitions/min OB girls: 21.6±8.6 rep/min OB: 1.7% has a good abdominal strength 2.9% reasonable 12.1% Poor		The data from the other groups are not really detailed in the paper.
Dumith et al., 2010 (Brazil)	519 7-15 yo boys and girls The exact repartition between NW/OW and OB is not detailed Obesity according to the WHO	Upper and Lower limbs muscle capacities	Lower limb power: stationary long jump Upper limb power: medicine-ball throw Upper limb strength: modified pull-up	Field tests with good reliability	Lower limb power: stationary long jump - NW>OW>OB Upper limb power: medicine-ball throw - Ns Upper limb strength: modified pull-up - NW>OW>OB		

	reference curves					
Riddiford-Harland et al., 2006 (Australia)	43 OB and 43 NW (mean age 8.4yo) Obesity according to Cole et al., 2000 (IOTF)	Upper and lower limb muscle capacities	Maximum upper limb isometric strength: push-pull load-cell tensiometer Upper limb power: chest pass (max horizontal displacement of the ball) Lower limb power: vertical jump and standing long jump Lower limb functional test: Rising from chair test	Field test with relatively good reliability	Upper limb power higher in OB No strength difference Lower limb power higher in NW Better lower limb functional capacities in NW	
Tokmakidis et al., 2006 (Greece)	709 (mean age 8.9±1.6yo) boys and girls 421 NW / 183 OW / 105 OB Obesity according to Cole et al., 2000 (IOTF)	Lower limbs muscle capacities	Standing broad Jump: explosive strength of lower limb	Relatively Good reliability	NW>OW>OB in both boys and girls	Few data details
Sacchetti et al., 2012 (Italy)	497 8-9 yo boys and girls 310 NW / 121 OW / 48 OB Obesity according to Cole et al., 2000 (IOTF)	Upper limb and Lower limbs muscle capacities	Upper limb strength: 2 kg medicine ball forward throw test Lower limb strength: standing long jump test	Field test with relatively good reliability	Upper limb strength - Boys and girls: NW < OW < OB Lower limb strength: - Boys and girls: NW>OW>OB	
Lazzer et al., 2009 (Italy)	25 OB 8-12 yo 30 NW 8-12 yo Italian curves : Cacciari et al., 2002	Lower limbs muscle capacities	Explosive ergometer (EXER, Udine, Italy) = combination of an isokinetic cycle ergometer with a force platform system. 4 all-out efforts with the two	Good reliability	Absolute peak force higher in OB (+18.2%) Peak speed no diff Absolute peak power higher in OB (+19.3%) Peak power normalized to body mass no diff between OB and NW boys but lower in OB girls compared to NW girls. Peak power normalized to fat free mass no diff between OB and NW	

			legs simultaneously (Zamparo et al., 2000)			
Dokic et al., 2013 (Serbia)	116 OB 8-15 yo 503 NW and 139 OW Obesity according to Cole et al., 2000 (IOTF)	Abdominal and upper and Lower limbs muscle capacities	upper limb strength: push-ups till failure abdominal muscular strength: press-ups 30' legs explosive strength: standing long jump	Indirect but valid tools.	Data are presented as OW vs.OB upper limb strength: push-ups till failure (rep) 12.35 ± 9.09 vs. 8.68 ± 8.6 ** abdominal muscular strength: press-ups 30' (s) 18.69 ± 3.95 vs. 16.53 ± 4.37 ** legs explosive strength: standing long jump (cm) 133.26 ± 19.82 ± 123.43 ± 20.37 **	data for the normal weight sample are not mentioned
Rauch et al., 2012 (Canada)	40 OB/OW 40 NW 8-18 yo OB BMI > 95th OW 85th < BMI < 95th percentile (exact ref non provided)	Lower limbs muscle capacities	Mechanography measurement device : force platform - A single two-leg jump (CMJ) : concentric contraction - Multiple one-legged hopping (6-10 hops) : eccentric contraction of the calf muscle	Good reliability	A single two-leg jump: peak force (+49%) and peak power (+19%) higher in OB OB jumped about 20% less high than NW Max vertical velocity about 17% lower Weight related peak force (-10%) and power (-26%) lower in obese Multiple one-legged hopping: peak force higher in OB in absolute but lower relatively to BW.	
Dao et al., 2004 (France)	55 (33 girls and 22 boys) 9-17 yo OB BMI > 97th percentile (French curves, Rolland-Cachera et al., 1991)	Upper and Lower limbs muscle capacities	Upper limb muscle strength: Handgrip dynamometer Explosive muscle strength: Vertical jump height – modified Sargent's test using a jump meter	Field tests with good reliability	Data are presented as before to after intervention In girls Right HGS (kgf): 25.5 ± 8.4 to 28.1 ± 8.2 ** Left HGS (kgf): 22.7 ± 6.7 to 23.9 ± 7.9 Two legs VJH (cm): 33.2 ± 7.4 to 36.6 ± 6.8** Right-VJH (cm): 23.8 ± 5.8 to 27.5 ± 5.0 *** Left VJH (cm): 22.9 ± 6.8 to 26.7 ± 4.9 *** In boys Right HGS (kgf): 32.6 ± 9.9 to 35.3 ± 10.7 * Left HGS (kgf): 29.4 ± 9.9 to 32.5 ± 9.6** Two legs VJH (cm): 37.7 ± 8.8 to 41.4 ± 8.5** Right-VJH (cm): 27.4 ± 6.7 to 29.0 ± 7.5 * Left VJH (cm): 26.3 ± 8.1 to 30.1 ± 8.5 **	The intervention was a multidisciplinary program (physical activity and diet restriction) of 9 ± 3 months
Huang & Malina, 2010 (Taiwan)	6365 9- 18 yo OB boys and girls 15401 NW 10673 OW	Abdominal and Lower limbs muscle capacities	Abdominal muscular strength: timed sit-ups Explosive leg power: standing long jump	Field test widely used. Good reliability	Abdominal muscular strength: timed sit-ups Performances decline with BMI Explosive leg power: standing long jump Performances decline with BMI	Detailed results difficult to find and follow in the paper (only figures and very

	Obesity according to Cole et al., 2000 (IOTF)						brief descriptions)
Poeta et al., 2012 (Brazil)	32 OB; mean age : 9.5 yo (16intervention and 16 control) CDC curves	Abdominal and upper limb muscle capacities	Abdominal strength: 1-min correct sit-ups number Upper body strength: max grip strength using a handgrip dynamometer	Field test with relatively good reliability	Intervention group (data are as follow: pre to post intervention) Right hand grip strength (kg): 19.0 ± 2.9 to 20.8 ± 3.9 * Left HG strength (kg): 18.1 ± 3.3 to 19.3 ± 4.4 Sit-ups (nbr): 16.2 ± 8.8 to 18.2 ± 9.4 * control group (data are as follow: pre to post intervention-time) Right hand grip strength (kg): 21.2 ± 5.2 to 20.0 ± 5.0 * Left HG strength (kg): 19.1 ± 5.2 to 18.5 ± 5.1 Sit-ups (nbr): 13.6 ± 9.1 to 11.8 ± 9.0	Intervention was: 12 weeks of physical activity (3/week)and dietary guidance	Data were not compared between intervention and control (only pre and post inside groups)
Ward et al., 1997 (USA / African American participants)	54 OB African-American girls mean age 10.7±0.7 yo 96 NW African-American girls mean age 10.8±0.6 yo 85th percentile according to NHANES 1	upper limbs muscle capacities	Maximal shoulder extension and elbow flexion via isometric cable tensiometer strength tests	Good reliability	Data presented as OB vs. NW Shoulder extension Absolute (kg): 20.8±4.2 vs. 18.6±4.1* Relative to BM (kg/kg): 0.82±0.18 vs. 1.01±0.21** Relative to FFM (kg/kg FFM): 0.54±0.12 vs. 0.56±0.12 ns Elbow flexion Absolute (kg): 22.7±3.9 vs. 21.2±4.5* Relative to BM (kg/kg): 0.90±0.19 vs. 1.15±0.23*** Relative to FFM (kg/kg FFM): 0.59±0.11 vs. 0.64±0.12*		
Tsiros et al., 2012 (Australia)	107 10-13 yo OB 132 10-13 yo NW Obesity according to Cole et al., 2000 (IOTF)	Lower limbs muscle capacities	Isokinetic dynamometer (Biodex) on both limbs	Very good reliability, laboratory test	Data are presented as Peak torque in Nm ob vs. lean Isometric dominant limb Absolute: 124.6 ± 4.6 vs. 106.2 ± 2.9 *** Per kk of mass: 13.3 ± 0.4 vs. 14.8 ± 0.4 ** Per kg FFM: 5.0 ± 0.1 vs. 4.39 ± 0.1 Isometric non dominant limb Absolute: 114.4 ± 4.4 vs. 101.6 ± 2.8 ** Per kg of mass: 12.6 ± 0.4 vs. 14.2 ± 0.4** Per kg FFM: 4.7 ± 0.1 vs. 4.6 ± 0.1 Isokinetic dominant limb Absolute: 101.0 ± 3.6 vs. 88.5 ± 2.2**		

					<p>Per kg of mass: 8.5 ± 0.3 vs. 10.0 ± 0.2 ***</p> <p>Per kg FFM: 2.6 ± 0.1 vs. 2.6 ± 0.1</p> <p>Isokinetic non-dominant limb</p> <p>Absolute: 97.4 ± 3.6 vs. 85.2 ± 2.2 **</p> <p>Per kg of mass: 8.2 ± 0.3 vs. 9.6 ± 0.2 ***</p> <p>Per kg FFM: 2.6 ± 0.1 vs. 2.6 ± 0.1</p>		
<p>Lau et al., 2004</p> <p>(China)</p>	<p>37 10-17 yo OB boys and girls</p> <p>21 in the intervention program and 16 control</p> <p>Obesity definition not mentioned</p>	<p>Upper and Lower limbs muscle capacities</p>	<p>5RM at (main stations):</p> <p>Chest press</p> <p>Shoulder press</p> <p>Leg press</p> <p>Leg extension</p> <p>Leg curl</p> <p>push-ups</p> <p>Triceps extension</p>	<p>Field test widely used.</p> <p>Good reliability</p>	<p>↑ leg and chest strength in both groups but higher in the intervention group</p>	<p>6 week resistance training program</p> <p>3x/week (plus diet in both intervention and control group).</p>	<p>Data not detailed in the paper</p>
<p>Liao et al., 2013</p> <p>(Taiwan)</p>	<p>2093 10-18 yo OB</p> <p>9621 10-18 yo NW</p> <p>1786 10-18 yo OW</p> <p>BMI percentile according to Taiwanese charts (Chen & Chang, 2010) (95th percentile)</p>	<p>Abdominal and Lower limbs muscle capacities</p>	<p>Lower body explosive strength: standing long jump test</p> <p>Abdominal strength: bent-leg-sit-up test</p>	<p>Field test widely used.</p> <p>Good reliability</p>	<p>Abdominal muscular strength and Lower body explosive strength are inversely correlated with BMI in both girls and boys.</p> <p>Performances have been divided in quintile with a significantly higher prevalence of obesity in the less fit quintiles in both boys and girls.</p> <p>Odd ratios of being obese are higher in the less fit quintiles.</p>		
<p>Pienaar et al., 2013</p> <p>(South Africa)</p>	<p>Intervention group 20 11 ± 0.99 yo OB boys and girls</p> <p>Control group 17 11 ± 0.99 yo OB boys and girls</p> <p>Obesity according to Cole et al., 2000 (IOTF)</p>	<p>Abdominal upper and Lower limbs muscle capacities</p>	<p>Leg muscular strength: standing long jump</p> <p>Arm muscular endurance: knee push-ups</p> <p>Abdominal muscular endurance: bent-leg sit-ups</p> <p>Leg muscular endurance: wall sit</p> <p>Back muscular endurance: v-up</p>	<p>Field test with relatively good reliability</p>	<p>Baseline data:</p> <p>Base line values:</p> <p>Leg muscular strength / standing long jump: - No diff (I: 110.6 ± 19.06 vs C: 109.1 ± 20.48 cm)</p> <p>Muscular endurance:</p> <p>Knee push-ups: No dif: (I: 11 ± 5.4 vs C: 11.8 ± 6.2 nbr)</p> <p>Sit-ups: No diff (I: 10.4 ± 4.3 vs C: 13.2 ± 5.5 nbr)</p> <p>Wall sit: no diff (I: 37.01 ± 19.4 vs C: 39.5 ± 19.5 sec)</p> <p>V-up: No diff (I: 38.6 ± 18.2 vs C: 47.4 ± 14.5 sec)</p> <p>Post intervention results:</p> <p>Leg muscular strength / standing long jump: PrT: 114.64 vs. PoT: 121.27 vs FT: 126.91 : no sign diff</p>	<p>Intervention: PA+diet+behavioural modification. 13 weeks, 3xweek</p>	<p>Prt: pre-test</p> <p>Pot: Poste test</p> <p>FT: Follow up tests</p>

					<p>Muscular endurance: Knee push-ups: PrT: 10.4 vs. PoT: 16.6 vs FT: 11.9: PrT<PoT Sit-ups: PrT: 11.1 vs. PoT: 13.5 vs FT: 11.2: no diff Wall sit: PrT: 35.5 vs. PoT: 53.6 vs FT: 46: no diff V-up: PrT: 36.4 vs. PoT: 57.1 vs FT: 45.8: PrT<PoT</p>
O'Malley et al., 2012	17 OB 12.41 mean yo boys and girls	Lower limbs muscle capacities	Isokinetic dynamometry (Biodex System 3)	Very good reliability / laboratory tests	Positive relation between PA and muscle strength Inverse relation between sedentary activities and muscle strength
(Ireland)	BMI > 97th percentile (exact ref non provided)				
Abdemoula et al., 2012	12 severely OB boys 12-14 y 10 NW boys (age matched)	Lower limbs muscle capacities	Home-built ergometer dedicated to isometric MVC strength of the knee extensor	Although this is a home-made ergometer, it has been design to specifically assess this outcome and rests upon previously published methods.	Absolute MVC torque higher in OB vs. NW MVC torque/Body Mass lower in OB vs. NW MVC torque/ FFM: no significant weight status effect MVC torque/Muscle mass higher in OB vs. NW
(France)	Obesity according to Cole et al., 2000 (IOTF)				
Duché et al., 2002	44 OB 12-16 yo boys and girls 50 NW 12-16 yo boys and girls	Lower limbs muscle capacities	Force-velocity test using a friction-load ergometer (Ergomeca)	Good reliability	CPP (W) was higher in OB vs NW CPP (W/kg BW) lower in OB CPP (W/kg FFM) no weight status difference
(France)	BMI > 97th percentile (French curves, Roland-Cachera et al., 1991)				Fopt (N) higher in OB Fopt (N/kg BW) lower in OB Vopt (rpm) lower in OB
Karner-Resek et al., 2013	28 OW or OB boys and girls 12-17 yo	Lower limbs muscle capacities	Wingate-20-seconds anaerobic test using a magnetically braked cycle ergometer: Peak mechanical power (w) Peak P-20 (W/kg BW) Mean power (w)	Good reliability	Data as pre to post intervention Boys Peak 20: 7.2±1.4 to 7.8±1.4 w/kg Mean power: 3.4 ± 1.1 to 5.9 ± 1.4 W/kg Girls Mean power: 3.4 ± 1.4 to 5.6 ±1.5 W/kg
(Switzerland)	Obesity definition not specified				8 weeks of physical activity and diet restriction
Lee et al., 2012	40 OB 12-18 yo	Lower limbs muscle capacities	One repetition maximum test for the	Field test with relatively good	Upper body : 53.2 ± 15.2 kg (range: 31.8 – 86.4) Lower body : 64.6 ± 13.8 kg (range : 43.2 – 89.8)

(USA)	BMI > 95th percentile (exact ref non provided)		supine bench press and seated leg press using weight stack equipment	reliability	Muscular strength index : 1.2 ± 0.2 (range: 0.7 – 1.9)	
Deforche et al., 2003 (Belgium)	230 12-18 yo OB boys and girls 2976 NW 12-18 year-old >90th percentile according to the Flemish growth charts (Aelvoet et al., 2000)	Lower and upper limbs muscle capacities	Explosive strength : standing-broad jump Static strength: handgrip Trunk strength: sit-ups Upper body strength: bent-arm hang	Field test widely used. Good reliability	Explosive strength : standing-broad jump + Trunk strength: sit-ups + Upper body strength: bent-arm hang NW had better performance (no age or gender effect) Static strength: handgrip Obese had better performances (no age or gender effect)	
Tsang et al., 2010 (Australia)	20 13.1±2.1 yo boys and girls Obesity according to Cole et al., 2000 (IOTF)	Lower and upper limbs muscle capacities	Lower and upper Maximal muscle strength: Chest and leg press 1RM Lower and upper peak muscle power: Load lifting as quick as possible at several percent of their most recent 1RM Muscle endurance: 80% of the 1RM: max repetition	Field test with relatively good reliability	The sample was divided into two subgroups both following an intervention (with different martial art exercises) GROUP 1 (baseline to post intervention) Lower 1RM (N/LegLBM): 0.04±0.01 to 0.04±0.01 Upper 1RM (N/ArmLBM): 0.034±0.005 to 0.034±0.006 Lower peak power (W): 337.8 to 288 Upper peak power (W): 101.5±27.4 to 112.4±29.6 Lower endurance (reps): 10.2±4.8 to 14.5±12.6 Upper endurance (reps): 5.0±2.5 to 7.4±3.0* GROUP 2 (baseline to post intervention) Lower 1RM (N/LegLBM): 0.03±0.01 to 0.04±0.01 Upper 1RM (N/ArmLBM): 0.029±0.006 to 0.030±0.005 Lower peak power (W): 282.0 to 316.0 Upper peak power (W): 92.9±24.1 to 92.9±31.8 Lower endurance (reps): 16.0±8.9 to 20.3±0.04 Upper endurance (reps): 5.9±1.9 to 7.5±2.3*	The intervention consisted in a 6-month training / 1-hour per week
Maffioletti et al., 2008 (Italy)	10 13-17 YO OB boys 10 age-matched NW BMI > 97th	Lower limbs muscle capacities	Isokinetic and isometric muscle function on quadriceps and muscle strength with knee extension /	Very good reliability / laboratory tests	Absolute isokinetic torque higher in OB (+16.3%) Isokinetic torque normalized to FFM was identical between groups. Angle of peak torque smaller in OB (-6%) OB produce their max strength at shorter quadriceps muscle length compare to NW	

	percentile (exact ref non provided)		Cybox		Absolute isometric torque higher in OB group at short quadriceps length (+24.6%) but not at long length Isometric torque normalized to FFM: no difference
Fogelholm et al., 2008 (Finland)	330 OW 1936 NW 15-16 years old Obesity according to Cole et al., 2000 (IOTF)	abdominal and Lower limbs muscle capacities	abdominal muscular strength: sit-ups till failure legs explosive power: Five-jump	Field test with relatively good reliability	Data are presented as NW vs. OW BOYS abdominal strength: sit-ups (nbr): 70.4±37.9 vs. 48.7±29 *** legs explosive power: Five-jump (m): 10.7±1.1 vs. 9.8±1.2*** GIRLS abdominal strength: sit-ups (nbr): 57.4±35.8 vs. 33.9±19.1*** legs explosive power: Five-jump (m): 8.9±0.9 vs. 8.1±0.8***
Blimkie et al., 1990 (Canada)	11 OB males, 15 to 18 yo 10 age-matched NW Obesity: >30% body fat using skinfolds	Lower limbs muscle capacities	Isometric strength: custom made dynamometer Isokinetic strength: maximal voluntary knee extension strength using Cybex dynamometer Twitch contractile properties: Evoked isometric strength using the same custom-made dynamometer Motor unit activation: Belanger and McComas method (1981) Thigh morphology: computed axial tomography scanning	Good reliability	Thigh morphology: OB have larger thigh and fat cross sectional areas (CSA); no diff in lean, bone and KE CSA. Voluntary strength: OB have significantly lower Isometric and isokinetic strength expressed per kg BM. Contractile properties: no diff Motor unit activation: OB have lower mean degree of activation during maximal voluntary isometric KE

n: participant number; NW: Normal Weight; OW: Overweight; OB: Obese; UW: Underweight; WHO: World Health Organization; IOTF: International Obesity Task Force; ANOVA: Analyze of Variance; yo: years old; BMI: Body Mass Index; PA: Physical Activity; *p<0.05; PE: Physical Education; ns: non-significant; MVC: Maximal voluntary

contraction; CPP: Cycling Peak Power; SJ: Squat Jump; Fopt: Optimal Force; KE: Knee Extension; HGS: Hand Grip Strength; VJH: Vertical Jump Height; FFM: Fat Free Mass; BM: Body Mass; LBM: Lean Body Mass; kg: kilograms; CDC; Center for Disease Control.